

# THE MINING AND METALLURGICAL JOURNAL.

FORMERLY THE PACIFIC COAST BULLION.

VOL. XVII., No. 5

LOS ANGELES, CAL., JUNE 1, 1897

PRICE, 10 CENTS

## The Gold & Silver Extraction Co. OF AMERICA, LIMITED.



CAPITAL  
\$250,000

The Original  
Cyanide Process  
Simple  
Reliable  
Economical  
Gold Medal Colum-  
bian Exposition  
1893

Mine Owners and others having Refractory and Low Grade Gold and Silver Ores and Tailings should have their material tested by

The MacArthur-Forrest Cyanide Process. Samples assayed and fully reported upon. Particulars upon application.

ADVISORY BOARD IN THE UNITED STATES  
Geo. A. Anderson, General Manager;  
Hugh Butler, Attorney; W. S. Ward;  
J. Stanley Muir, Technical Manager.  
CALIFORNIA AND NEVADA AGENTS,  
Hertram Hunt, 216 Sansome St., San Francisco

Office: McPhie Building, - Denver, Col.

## THE EDWARD P. ALLIS COMPANY

MANUFACTURERS OF

### Mining, Milling and Smelting Machinery

Crushers, Concentrators, Pumps, Compressors, Hoists, Boilers,  
Reliance Crushing Rolls, Reynolds Corliss Engines, &c.

Send for Catalogue.

Milwaukee, Wis.

## THE RUSSELL PROCESS

*The Improved Method of Lixiviation  
for Free and Rebelious Silver and  
Gold Ores and Tailings, Either Raw  
or After Roasting. Send for New  
Publications Just Issued : : :*

The Russell Process Co. - Park City, Utah.

## ROESSLER & HASSLACHER Chemical Co.

73 Pine St., New York

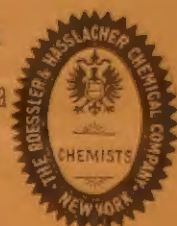
## CYANIDE

Peroxide of Sodium

Hyposulphite of Soda

Chloride of Lime

Sulphide of Iron



Trade Mark  
And Other Chemicals for Mining Purposes.

## The California HAMMERED STEEL Shoes and Dies

Warranted Not to Clip Off or Batter Up. A HOME PRODUCTION

Best Refined Cast Tool Steel, Well Bit Steel, Heavy and Light Iron and Steel Forgings of all Descriptions.

GEO. W. PENNINGTON & SONS, 218 and 220 Folsom street, SAN FRANCISCO, CAL.

PLEASE MENTION THE JOURNAL

## ADAMANTINE SHOES & DIES

AND CHROME CAST STEEL

Cams, Tappets, Bosses, Roll Shells and Crusher Plates.

These castings are extensively used in all the Mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to above conditions. When ordering send sketch with exact dimensions. Send for Illustrated Circular

CHROME STEEL WORKS,

Kent Ave. & Keap St., - BROOKLYN, N. Y.

## The Pelton Water Wheel

Affords the Most Economical and Reliable Power for Mining, Electric and all other purposes.

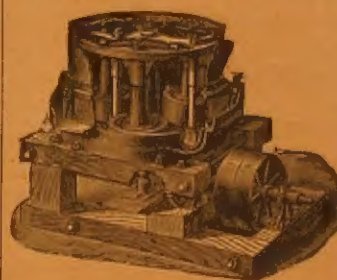
7000 WHEELS NOW RUNNING

PELTON WATER WHEEL CO., 121 Main St., San Francisco, Cal.

## PARKE & LACY COMPANY

21 and 23 FREMONT STREET, SAN FRANCISCO, CAL.

LICENSEE FOR THE MANUFACTURE AND SALE OF



### The Huntington Centrifugal Roller Quartz Mill

THE HUNTINGTON MILL is so well and favorably known among mining men throughout the world that any description of it would seem superfluous. They are in use in the United States, Canada, Mexico, Central and South America, Australia, China, Japan, and South Africa. In fact, wherever mines exist, and have given the best satisfaction of all quartz crushing mills.

The construction of this mill has lately been much improved and we claim it to be the CHEAPEST, MOST EFFICIENT, SIMPLEST, AND MOST DURABLE MILL UPON THE MARKET.

← CATALOGUE UPON APPLICATION →

## Am. Zinc-Lead Smelter

CANON CITY, COLORADO.

## NEW MEXICO AND ARIZONA SMELTER

Washington, Pima County, Arizona.

Will buy all kinds of ores; specially made of copper ores and those containing zinc. Low grade refractory ores desired. Write for prices to either smelter.

CHAS. W. CROWE, Agent

New Mexico and Arizona Smelter

P. L. BARTLETT, General Manager

Canon City, Colorado.

## Consolidated Kansas City Smelting & Refining Co.

BUYERS OF ALL CLASSES OF

### BULLION, MATTE, ORE & MILL PRODUCTS, GOLD & SILVER BARS

Smelting Works { Leadville, Colorado.  
{ El Paso, Texas.  
{ Argentine, Kansas.

REFINERIES: ARGENTINE KANSAS.

FOLLOWING CODES USED: At Argentine, Kansas.

A. B. C.  
Moreing & Hall's  
and Bedford, McNeill's.

Ore Purchasing Agencies

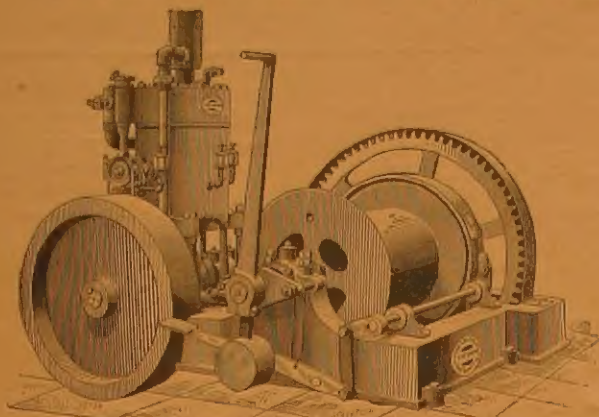
Spokane, Wash. Salt Lake, Utah.  
Leadville, Colorado. Denver, Colorado.  
El Paso, Texas. Argentine, Kansas.  
Cripple Creek, Colorado.



**McDearmon & Co.**  
Asbestos Boiler & Steam Pipe Coverings  
Asbestos Cement for Boilers, drums, Heaters,  
Etc. Special facilities for supplying  
the mining trade.  
Pacific Coast Agent for H. W. John's Co's Asbestos  
Jacketed Coverings.  
422 Sacramento Street, San Francisco, Cal.

**AXELSON MACHINE COMPANY**  
HIGH GRADE MACHINE WORKS  
**SPECIAL TOOLS TO ORDER**  
Gear Cutting, Milling and Universal Grind-  
ing, Jobbing and Repairing.  
1101-3-5 North Main Street, Los Angeles, Cal.

## "Union" Hoist



Union Gas or Oil Engine and Hoist Combined, on strong, iron base.

**No Fire No Steam No Boiler No Danger**  
TEN YEARS' EXPERIENCE. Two THOUSAND ENGINES IN USE.

Started instantly. Compact, strong, simple, efficient, economical. Perfectly governed, so that oil is used only in proportion to the work done. No expense when idle.

Particularly Adapted to Mining in Localities Where  
Fuel and Water are Expensive.

Built in the following sizes: 1-1 H.P., 4 H.P., 6 H.P., 8 H.P., 10 H.P., 15 H.P.,  
20 H.P., 30 H.P., 40 H.P.

Send for Catalogue and state what H. P. required.

**Union Gas Engine Co.,**

301 Howard Street, San Francisco, Cal.

**Morgan & Co.**  
MINING-SMELTING  
FOR 35 YEARS  
PRACTICAL  
**ORE TESTING**  
REFINING ASSAYING  
CYANIDE AND OTHER PROCESSES  
MINES EXAMINED AND DEALT IN  
BULLION PURCHASED

Office: Room 200-201  
Wilson Block  
115 & 117 S. Main St.  
LOS ANGELES, CAL.

Bank References:  
California Bank & Trust Co.  
Los Angeles City Bank  
Pacific State Bank  
San Francisco, Cal.

IN WARES  
FRANCE  
GERMANY  
ENGLAND  
SPAIN  
AUSTRIA  
U. S. A.

**FRANKLIN BOOTH**  
MINING ENGINEER AND METALLURGIST

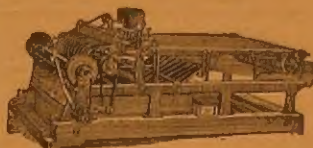
**... With L. BOOTH & SONS,**  
MECHANICAL ENGINEERS AND DEALERS IN

**Machinery and Mining Supplies**

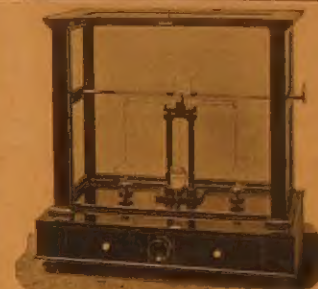
AGENTS Union Gasoline Hoists, Joshua Hendy Stamp  
Mills, Rock Breakers, Ore Buckets, and Cams, Davis Horse Whim, Dean  
and Marsh Steam Pumps, Pennsylvania Boiler Works, Chandler  
Taylor Engines, Agent Dodge Manufacturing Co's Wood-  
Split Pulleys and Power Transmission Machinery,  
Rubber and Leather Belting and Oils.

338 North Main street, BAKER BLOCK, Los Angeles, Cal.

**WOODBURY CONCENTRATOR**



No. 141 First St., San Francisco



**AINSWORTH NO. 043.**

SENSIBLE TO 1-100 MILLIGRAMME  
Ten-inch beam on which you can weigh from  
1-100 to 1 Milligramme with a one milligramme  
rider.

Complete catalogue of Assayers' and Chemists'  
supplies, including this and other balances, mailed  
upon application. SELLING AGENTS,

**The Denver Fire Clay Co.,**

1742-1746 Champa St., Denver, Colo.  
P. O. BOX, 1540

## Rix Compressed Air Machinery Co.

11 and 13 First Street, San Francisco, Cal.

MANUFACTURERS OF

Pneumatic Machinery of all kinds,  
Rock Drills.

Air Compressors.

Compressed Air Hoisting Engines.

Stone Cutting and Carving Tools, driven by  
Compressed air.

Compressed Air Machinery for quarrying stone  
Compressed Air Pumps for both cold & hot air  
Appliances for reheating compressed air.

"Ferrite" Shoes and Dies.

Projectile Steel Shoes and Dies.

Guaranteed to be the most economical Shoe and Die  
on the market.

ALSO DEALERS IN

**General Mining Machinery**

Send for Latest Catalogue.



FULL LINE OF  
**Chemical  
Glassware**

Of every descrip-  
tion carried in stock,  
and sold wholesale  
and retail at

**EASTERN  
PRICES**

BY THE

**Pacific Optical  
Company.**



Manufacturers and Importers

245 SOUTH SPRING STREET,

LOS ANGELES, CAL.

We also carry a full line of Magni-  
fiers, Microscopes, Compasses, Bar-  
ometers, Surveying Instruments, Ther-  
mometers, and Hydrometers in stock  
in both our wholesale and retail  
departments.

SEND FOR OUR PRICES





SOLE AGENTS FOR

# CANTON DRILL STEEL

John A. Roebling's Sons Co's  
WIRE CABLES.

## Giant Powder

117 to 123 S. LOS ANGELES ST.  
LOS ANGELES, CAL.

**IRON & STEEL**  
**WATER PIPE & WELL CASING**

873-889 STEPHENSON AVENUE, LOS ANGELES, CAL.  
**A. C. HARPER, Proprietor.**

Telephone Main 420 Post Office Box 867

234 N. HILL STREET, LOS ANGELES, CAL.



OTTO HECKELMANN

FERDINAND McCANN

**ASSAYERS AND CHEMISTS.****Heckelmann & McCann + + Bullion Dealers**

Cash paid for all kinds of Gold, Silver and Ores. All assays and Chemical Analysis at Mexican Silver Rates, 50 per cent. Less than American Price.

PUENTE DE SAN FRANCISCO, No. 6

CITY OF MEXICO

**Mexican, American and Foreign Patents, TRADEMARKS, ETC.**

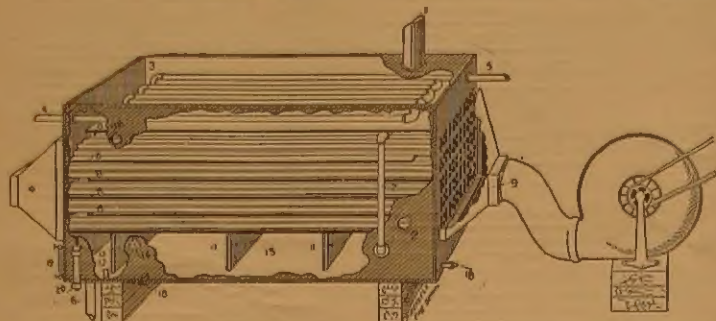
Reports on Mining and Other Properties.

Proprietors of *Weekly Anglo-American*, a first-class Advertising Medium. Established 2 Years.

**C. H. M. y Agramonte,**

P. O. Box 388. Cable Address, "Agra".

CITY OF MEXICO, MEXICO.

**Kellers' New Improved Feed Water Heater, Purifier, Condenser, and Hot Air Blast Combined.**

180 deg. of hot air forced out of device which can be utilized for drying or heating purposes or carried under the boiler furnaces as a force draft. The foul air can all be drawn out of mine with this same attachment. Where the air is not required leave off the Fan, it will not condense quite so fast, but other results will be the same. This Device is endorsed by practical Mechanics and the largest Smelters and Plants in the country. This is the ONLY HEATER ENDORSED BY THE AMERICAN INSTITUTE OF MINING ENGINEERS. Send for Descriptive Catalogue.

**Star Boiler, Sheet Iron and Feed Water Heater Works,**

2166-76 FIFTEENTH STREET,

DENVER, COLORADO

Built entirely upon new mechanical lines to that of all other Heaters; 80 per cent of fuel saved, and Steam condensed saving nearly one half of Water Bill.

No compounds needed to keep boilers from scaling as all impurities are precipitated and lodged in the tank.

Feed water is superheated after it leaves the pump and goes to the boiler at boiling temperature without "back pressure" on engine or no charge for Device; the Thermometer and Back Pressure Gage registers results.

**THEODOR LEXOW**

106 Broadway New York

Importers of

**CARBONS**

FOR —  
DIAMOND DRILLS and all Mechanical Purposes

Henry Demmert

**J. HOWARD WILSON****Assayer & Chemist**

A Specialty Made of Empire Work.

306 Santa Fe Ave. Pueblo, Colo.

**A. Kratzmer**

Iron and Brass Castings of all kinds, Shoes and Dies, Cams, Bases, Tappets, Mortars, etc., etc. Complete

**Stamp Mills**

of any size made and sold at strictly

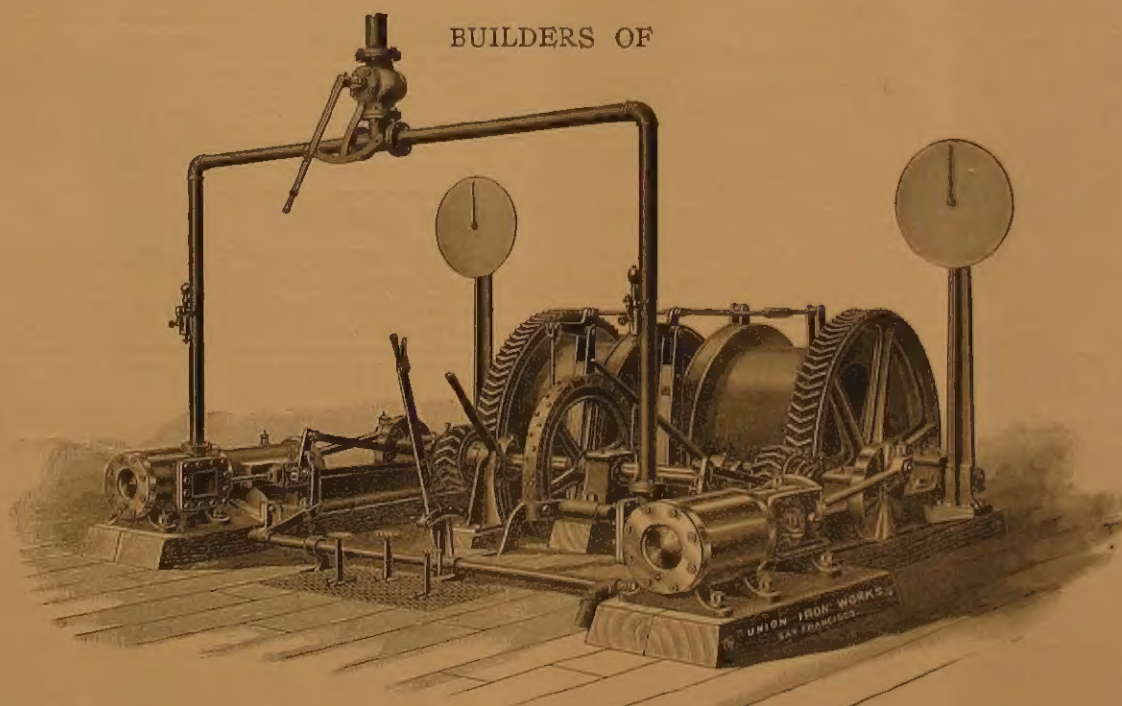
**San Francisco Prices.**

Correspondence Solicited.

BAKERSFIELD, CALIFORNIA.

**UNION IRON WORKS**

BUILDERS OF

**Mining, Milling, Concentrating and Smelting Machinery**

222 MARKET STREET, SAN FRANCISCO, CAL.

SEND FOR NEW CATALOGUE



**C. W. KEMPTON**  
**MINING ENGINEER**

Oro Blanco, Arizona  
20 years experience in exploration, mining and  
milling. 10 years as superintendent and manager,  
Boston, New York, and Chicago references.

**G. WHEATLEY,**  
**Mines and Mining**  
CORRESPONDENCE SOLICITED  
TUCSON, - - ARIZONA

Seventeen years' practical experience  
on Pacific Coast.

**L. E. AUBURY**

ASSAY OFFICE:  
1428 E Street

**Mining Engineer & Metallurgist**  
SAN DIEGO, CAL.  
Special attention given to examination and re-  
ports on mining properties on Pacific Coast.  
Reference, Blochman Banking Co., San Diego.

**Pacific Amalgamator**

PAT. APRIL 20, 1887

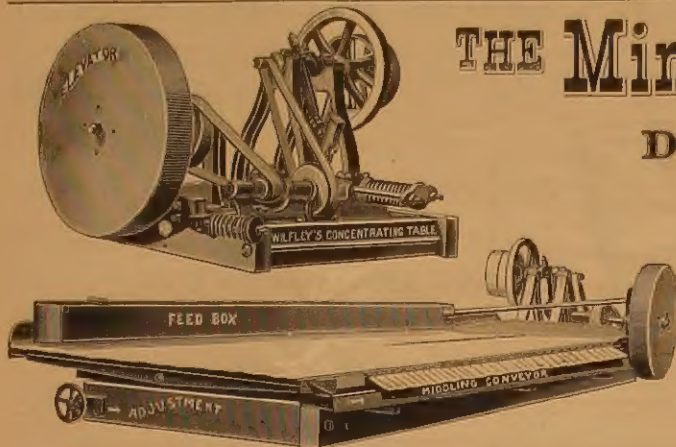
FOR PLACER OR MILL USE



No other plate necessary where the Pacific Amalgamator is used. These machines are sent out with a Guarantee backed by people who are responsible for what they say. They will place them in mills and sell subject to doing amount and character of work guaranteed before payment is made.

Mills in all parts of the country are throwing out plates and replacing them with Pacific Amalgamators.

Pacific Mining Machinery Co., 129 First St., San Francisco



# THE Mine AND Smelter Supply Co.

## DENVER, COLORADO

ARE SOLE AGENTS FOR THE

**WILFLEY  
CONCENTRATOR**

and claim for it BETTER work than any Concentrator made, with a capacity of from 15 to 25 tons per day of 24 hours. It is simplicity itself. No moving belts or intricate parts. Any one can learn to operate in an hour.

For confirmation of all of the above we refer to Henry Lowe, Puzzle Mine, Breckenridge, Colo.; M. K. Smith Concentrator, Golden, Colo.; Mary Murphy Mine, St. Elmo, Colo.; W. E. Kershaw; Mayflower Mill, Idaho Springs, Colo.; H. E. Woods, Denver, Colo.; Standard Mill, Wallace, Idaho; Smuggler Mill, Aspen, Colo.; Smuggler Union Mill, Telluride, Colo.

BRECKENRIDGE, COLO., Dec. 1, 1896.

THE MINE AND SMELTER SUPPLY CO., DENVER, COLO.

GENTLEMEN:—You asked us what experience we have had with the Wilfley Table, and we would state that after trying 4 Woodburys, 3 Frue Vanners, 1 Johnston, 1 Embury and Electrical Process; Hartz Jig and Buddies, we have found that the Wilfley Table is the only table that has given us satisfaction. We are using two tables, at a profit to our mill, where all other devices have proven a failure, and we can heartily recommend them to any intending purchasers. Yours very truly,

(Signed), R. DE BARNEUER, Supt.

We also Handle the Huson Wire Tramway.

These Tables have displaced belt tables of almost every make,  
as is shown by letters in our possession.

Price = \$450.

### Assayers AND Chemists SUPPLIES

MANUFACTURERS OF

Crucibles,  
Scorifiers,  
Muffles,

— AND —

• FIRE BRICK •

— AGENTS FOR —

Baker & Adamson's Celebrated  
Acids and Chemicals

— DEALERS IN —

Glassware,  
Porcelaine  
Goods, Etc.

— THE —

**Standard Fire Brick Company,**  
Pueblo, Denver, Colo.

### THE GOLDEN GATE Gas or Gasoline Engine Mining Hoists A Specialty



MADE BY  
**ADAM SCHILLING & SONS**  
211 213 Main St., San Francisco.  
Send for Circulars and state Horse Power Required.

THE CHEAPEST is not Always the BEST!

POSITIVE STEADY MOTION!

### THOUSANDS Now in Use Over the World



TRUAX PATENT  
Automatic Ore Cars.

THE ARE THE BEST  
AND CHEAPEST.

**Truax M'f'g Co.**

DENVER, COLORADO.

120 Only Exclusive Ore Car Manufacturers in America.

Pat. Jan. 5, '92, Aug. 27, '95.

Send for Catalogue, or call on your dealer for Truax Cars.



### The "Journal" Office

Is located in the Stimson Block  
LOS ANGELES, CAL.

### ALL THE MINING CAMPS OF UTAH AND COLORADO

ARE LOCATED ON OR REACHED BY THE

### RIO GRANDE WESTERN RAILWAY

**MERCUR**

JOHANNESBURG

**AMERICA**

NEW

**WONDERFUL**

CAMP

45 MILES FROM  
SALT LAKE CITY



**CRIPPLE CREEK**

THE GREATEST GOLD  
CAMP IN THE WORLD

ONLY

4

YEARS OLD

300 SHIPPING MINES  
IN THE DISTRICT

THE SHORTEST, QUICKEST AND MOST DIRECT ROUTE TO

### MERCUR AND CRIPPLE CREEK

W. H. SNEDEKER,  
1000 MARKET STREET  
SAN FRANCISCO

FOR RATES OR ANY OTHER INFORMATION APPLY TO  
D. C. DODGE, 1000 MARKET STREET  
S. H. BABCOCK, 1000 MARKET STREET

F. A. WADSWORTH,  
GENERAL PASSENGER AGENT  
SALT LAKE CITY

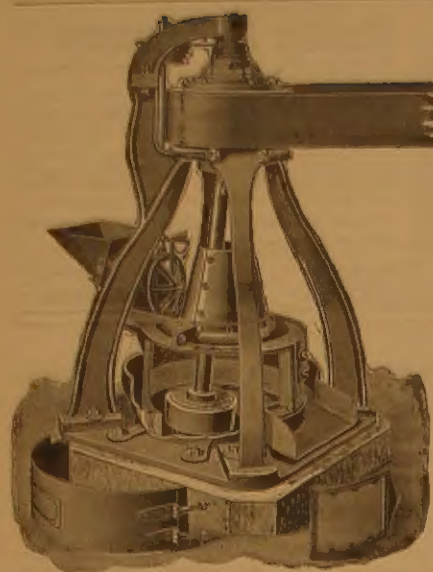
### S. S. MACHINERY CO.

Buy, Sell and Trade in All Kinds of SECOND-HAND  
Mining and Wood Working Machinery.

CORRESPONDENCE SOLICITED.  
OFFICE: 1529 Lawrence  
WORKS: Sixth and Market

DENVER, COLORADO  
TELEPHONE (Office, 120  
Works, 1234)





## THE GRIFFIN MILL

The only Perfect Pulverizer Working both Wet or Dry Process

NO JOURNALS IN PULVERIZING CHAMBER.

Delivers a finished product. Will pulverize 1 to 2 tons per hour on Portland Cement, Quartz or ores depending on hardness of material and firmness of product.

— Manufactured and Sold by —

Bradley Pulverizer Co.,

95 STATE STREET,  
Boston, Mass.

## Assayers' Miners' and Chemists' Supplies



Crucibles, Muffles,  
Scorifiers, Furnaces,  
Cupels, &c., &c.

C. P. CYANIDE POTASH (98-99 per cent)

Dioxide Sodium, Zinc Shavings,  
Borax Glass, Litharge,  
C. P. Test Lead



AND EVERYTHING REQUIRED BY



Assayers' Miners' and Chemists'

We invite Correspondence and solicit orders.

F. W. Braun & Co.,

401 to 407 N. Main St., Los Angeles



Roller, Steel and Special Chains

ELEVATING  
AND CONVEYING  
MACHINERY.

FOR HANDLING MATERIAL OF ALL KINDS.

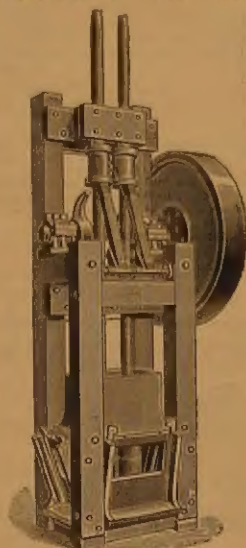
POWER TRANSMISSION  
MACHINERY.

COAL MINING MACHINERY.

Wire Cable  
Conveyors.  
For long and  
short distance  
conveying.

THE JEFFREY MFG. CO. 163 Washington St.  
Columbus, Ohio. NEW YORK.  
Send for Catalogue.

## "HENDY" IMPROVED



Triple Discharge Two-Stamp

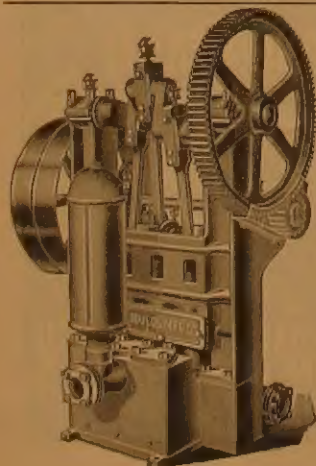
MILL

Capacity six to ten tons per day  
PRICE, \$450.00

JOSHUA HENDY MACHINE WORKS

38 to 44 Fremont St., San Francisco, Cal.

J. B. TOMLINSON, M. E.  
Prescott, Arizona,  
MINING PROPERTIES EXAMINED, AP-  
PROVED AND REPORTED UPON  
AND  
Supervision taken of the development of prop-  
erty and the operation of mines.



Triplex Power Pumps,  
FOR EVERY SERVICE.

No Plant too Large  
No Plant too Small

All the Information you desire by ad-  
dressing, stating your wants,

J. I. Hathaway,  
SPECIAL AGENT,

122 W. 2d Street, Los Angeles

## EAGAR & CO.

Assay Office and Sampling Works.

Assaying, Mill Tests, Cyanide Tests, Etc. Special Attention to work sent by Mail.

No. 10 Stevenson Street,

San Francisco, Cal.

Chas. P. Grimwood,  
Mining Engineer and Metallurgist  
Laboratory, 214 Pine Street, SAN FRANCISCO, CAL.

WM. H. HOEGEE

MANUFACTURER OF

Oiled Clothing, Awnings, Tents, Sails, Taraulins, Flags, Banners, and  
Camp Furniture. Tents and Canvas Floors for Rent.  
Jobber of Cotton Duck, Etc.

136 S. Main Street,

LOS ANGELES, CAL.

## A SELF-EVIDENT FACT.

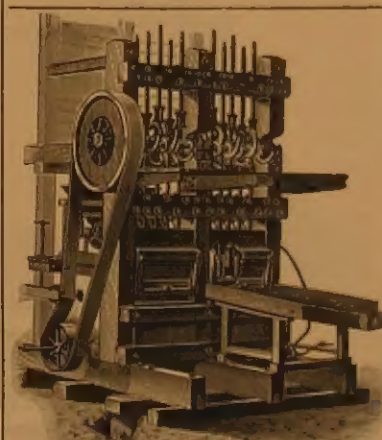
In the treatment of many low grade ores, the  
margin of profit is sometimes so small that  
great care and judgment is required in the se-  
lection of properly designed machines and  
appliances as well as in the arrangement of  
the same. The manufacture of

## MINING MACHINERY

of every description is our specialty. Our new  
shops were specially designed for this purpose.

Gates Rock and Ore Breakers

Have acquired a reputation for superiority  
world-wide in extent.



Crushing Rolls, Stamp Mills, Smelters, Concentrators,  
Pans, Settlers, Hoisting, Conveying and  
Pumping Machinery.

Complete Installations for all Methods of Treatment.  
For Catalogues and further information, address

Gates Iron Works, 650 Elston Ave, Chicago, U.S.A.

New York  
136 Liberty St.

London, E. C.  
73 A Queen Victoria St.

Batle, Mont  
Silver Bow Block

City of Mexico  
Calle de Gato No. 3



INSURED AT THE ROSE OFFICE AT LOS ANGELES, CALIFORNIA,  
AT SECOND CLASS MAIL MATTER.

F. W. EDELSTEN, Editor.

LIONEL A. SHELDON,  
Special Contributor.

ULRICH KNOCH, Publisher

OFFICE, Stimson Block, Los Angeles, Cal.

SUBSCRIPTION PRICE:

For United States, Mexico and Canada.....	\$3.50 per annum
" " " " " "	1.25 six months
All other countries in the postal union.....	3.50 per annum
" " " " " "	1.25 six months

ISSUED SEMI-MONTHLY

### SPECIAL REPRESENTATIVES:

The Journal is kept on file at the following places where contracts for advertising can be made :

San Francisco, Cal.—E. C. Duke, 64 and 65 Merchants Exchange.

Salt Lake, Utah.--Art Advertising Supply Co., 60 West 2nd South Street.

Denver, Colorado—Ed. P. Eppich & Co., 47 Bank Building.  
Kansas City and St. Louis, Mo.—C. M. Venzey, 430 Nelson

Bldg., Kansas City, Mo.  
Chicago, Ill.—Newbegin & Co., Room 761, Monadnock Block

City of Mexico, Mexico—O. H. M. Agramonte, 17 Cinco De Mayo.

ADVERTISING RATES FURNISHED ON APPLICATION.

## A NEW THEORY ABOUT SILVER.

It is a theory advanced by Mr. Joseph Ashbury Johnson, in a communication to the *San Francisco Call*.

In substance it is "that there is a growing apprehension in the public mind that the gold basis is too narrow for the volume of currency necessary for commercial and industrial transactions, and hence there is urgent need for more primary or redemption money," that this, together with the large vote for silver in the United States, and the continued and active agitation for bimetallism, have frightened the goldites of the world, and they have adopted the plan of cornering and controlling the silver as well as the gold, remonetizing silver and reaping the profits.

There is no doubt that there is a growing sentiment as stated, nor of the fact that the goldites recognize the truth that the gold measure is too narrow and that sooner or later they must yield to the demands of commercial and industrial interests.

Recognition of this has caused the bankers of Europe and the United States to engage in a strife to get possession of gold, for whoever holds the largest amount has the greatest power in the financial and commercial world. Though in a sense there has been a struggle, yet the bankers operate on the same principle that has led to the concert of European powers in political matters. The purchasing power of gold has enabled its possessors to gain immense profits, and through their energies and influence, they have been able to dictate policies to governments, and they will continue to do so as long as possible, and there are no indications of their intention to desist from the course they have pursued.

The bankers, who hold the bulk of the gold in the world, will not yield until convinced that by taking another tack they can make more profit than in maintaining the gold monopoly.

The banks of Europe hold in the neighborhood of \$3,000,000,000 in gold. Remonetization of silver will reduce gold to nearly one

half its present importance. The question is, by buying up the silver mines, can they offset the loss that will ensue from the deterioration of gold values? It must be remembered that the profits from gold domination will continue as long as its ascendancy can be maintained; but the moment silver remonetization is effected, these profits will disappear.

By remonetization of silver, its commodity value will not be increased beyond its money value, and will never go above that, and, as soon as that point is attained, there will be no profit in silver mining beyond that which will exist between the cost of production and the price in the market, and in reality, the products of gold mining will be vastly reduced in value.

The idea of Mr. Johnson is on the cock and bull order. The money power will resist the enlargement of primary or redemption money to the very last and they cannot be overcome so long as they hold the purse strings in any country except the United States, and they will be preponderant here so long as the people can be cajoled or bought.

Under the impulse of remonetization, the production of silver in this country will be doubled at least, and very soon the volume of primary or redemption money would be increased to such proportions that shylockism would disappear, and profits to the Rothschilds and their financial ilk would be reduced to an extent that would bring disconsolation to their Hebraic hearts. The English capitalists may purchase silver mines, but they will not buy them to the detriment of gold, or, if they do buy them, they will cease having them worked to a point which will be detrimental to gold. English capitalists will buy everything they can make money out of. They buy gold mines, copper mines, invest in breweries—so long as the American people will guzzle beer to their profit.

As long as Americans contribute by their policies to the enrichment of Europeans, they will be made to bleed at every pore. The cock and bull theory of Mr. Joseph Ashbury Johnson is intended to frighten the friends of silver coinage, and to make them desist from the agitation of bimetalism. If bimetalism becomes the policy of European nations, not only American, but Mexican and all other silver will be enhanced in value, and the mass of mankind enriched to the detriment of the gold monopolists. Let the gold-ites buy the silver mines, if the effect will be to enliven commerce, stimulate enterprise, and give the masses more employment, and the means of a more comfortable and brighter life. Let the good work which threatens gold and every other monopoly, go on. Gold is not for the many but for the few. It is an autocrat, and let it be dethroned.

"IT WILL NOT DOWN."

The money issue cannot be suppressed, neither side will permit it. The silver party is active, and the self-styled sound money league is perfecting its organization, with a view to continued warfare. The latter is amply supplied with funds by the bankers and money lenders, while the former relies upon the patriotism of the American people. It is a question whether the government shall be controlled by the masses or the oligarchs of wealth. The contest is not new, so far as the principle involved is concerned, but as old as we have any knowledge of human history. The oligarchs of wealth managed to control, and at last managed to destroy every popular government of ancient times, and

they have not abated their efforts in modern times, and if their success has been less, it is because there is more intelligence and manhood.

The goldites pretend to want more prosperity, and to be working for it, but they press the measures that have produced depression and hard times with increased energy. It is a fact of history that the selfish class will assail good policies with far more vigor and persistency than the unselfish and patriotic will defend them. The test of American manhood and patriotism is being applied, and it is as severe as any that the country has ever been subjected to.

THERE IS NOTHING NEW IN IT.

The dispatches from Europe inform us that the commissioners sent to Europe, to solicit the calling of an international conference on the subject of silver coinage, are loitering about Paris, and waiting for the new Ambassador, through whom they wish to be introduced to the French President. It is stated also that they have been able to elicit the information that the French government will take no action in the matter until assured that Great Britain will take part in the conference.

In this there is nothing new, for intelligent men have been aware for a long time that Great Britain controlled the situation, and that no European government would yield to our solicitation until Great Britain had been won over. Traveling over the continent of Europe may be a pleasure to the commissioners, but their efforts are all useless to the cause of Europe until they capture the Gibraltar of goldism. If they can do that they will have rendered substantial service to the cause of silver.

## NOTHING SETTLED.

The late political contest seems to have settled no question, not even the tariff controversy, and certainly not the money issue. The administration is trying to dispose of the tariff question, and some kind of an act will soon be passed—how satisfactory it will be remains to be seen. When that is out of the way, the contest over the money question will commence. As there is need for more revenue to meet the expenditures authorized by congress, there is not serious controversy over the tariff bill, which embodies a re-modelling of the internal revenue taxes, as well as the customs duties; but when that is removed, the tug of war will come. In fact, it may be precipitated by an amendment which Mr. Stewart has given notice he will offer to the pending revenue bill. How urgently it will be pressed is for the moment a matter of conjecture merely. When the revenue bill is out of the way, it is undoubted that the financial question will absorb the attention of congress and the country.

The present session may be adjourned without bringing on the decisive battle, but it will surely occur soon. It will take place when, or after the commencement of the long session which takes place on the first Monday of December. In the meantime, agitation will proceed before the people, and the money question will be the absorbing topic.

In the past three years Owyhee county, Idaho, has produced \$7,000,000 in bullion.



# Tintic Mining District, Utah.

Some of the most pronounced evidences of the advancement that has been made in the science of mining and metallurgy are to be found in the state of Utah. Most of the mining states in the west depend almost entirely upon new discoveries for an increased output and although Utah is not behind any of the other prominent producers of precious metals in the way of new and valuable discoveries, it seems that the greatest wealth has been de-

Tintic Mining district was the Sunbeam, recorded Dec. 13, 1869. The district was organized in the same month and year; following closely came the Black Dragon, recorded in Jan., 1870. The names of William Harris, S. W. Worsley, Moroni Billingsley, Joseph Hyde and L. J. Whitney appear upon the location notice of the Sunbeam. The camp in its early stages passed through all the vicissitudes that new camps always pass

distinction of being the leading county in the state in the production of gold and silver, in 1896 the output being 40,470 ounces in gold and 3,955,843 ounces in silver. The name Tintic was taken from the famous Ute chief of that name, who claimed all the Tintic, North Tintic and West Tintic mining districts as his hunting grounds and resisted any encroachments on his territory. The Tintic Range Branch of the Rio Grande Western



VIEW OF EUREKA, UTAH.

veloped in camps that had been partially abandoned by the old timers who were not inclined to follow any lode to a sufficient depth to demonstrate its permanency and value. Many camps could be named within the borders of Utah that were entirely abandoned some years ago where today some of the best dividend paying mines on the American continent are being worked. The first claim of which any record was made in the

through in a country distant from civilization.

Utah seemed to be an exception to the western states in general, inasmuch as the first arrivals paid more attention to tilling the soil than prospecting the mountains for mineral.

Tintic Mining district is only about seventy miles south-west of Salt Lake City in Juab and Utah counties. Juab county enjoys the

railroad connects Eureka, Mammoth and Silver City, the principal towns of the Tintic Mining district, with Salt Lake City. On this branch, in making the ascent from Utah Valley to the summit of the Tintic range, is the "Double Circle", which is one of the most remarkable achievements of engineering to be found in the country. The road overcomes an elevation of 2,032 feet in less than seventeen miles, the largest part of the ascent





MAMMOTH STATION, R.G.W.RY., AND FARRELL MILL.

being accomplished in less than six miles. The track makes a compound loop, one section of road crossing another on a long trestle ninety feet above the road-bed. The original Tintic district embraces an area of 150 square miles, fifteen north and south by ten east and west; most of it being in Juab county with a portion of the eastern boundary in Utah county. Most of the important dividend paying mines are in a strip of territory six miles long by three miles wide. Silver City was the first mining settlement of the district, and the office of the district recorder has always been there. Diamond, just over a small hill to the south, was the home of the first settler in the district, although he disregarded the mineral wealth and contented himself with appropriating the only spring of water for miles around.

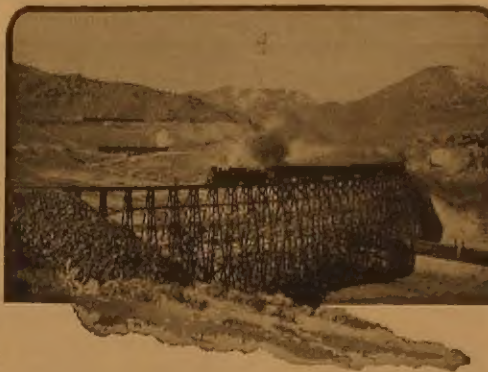
The country rock around Mammoth Hollow, Eureka and the northern half of the producing area is for the most part limestone, while Silver City and Diamond are in porphyry. The country around Diamond and Silver City is comparatively level. The fissures are nearly perpendicular, with a north and south strike. In the early times only the oxidized ores were sought, and the mines were abandoned when the sulphides were encountered at a depth of 200 feet in the belief that the pay chutes were exhausted. After Silver City had been practically abandoned for many years, the theory was advanced that perhaps with depth good ore would be uncovered. This was demonstrated to be a fact in the Swansea, where paying bodies of ore were encountered at 350 feet in depth. In this mine the oxidized ores on the surface and to a depth of nearly 250 feet were profitably worked, and the sinking of the shaft 100 feet deeper proved conclusively that the iron pyrites was simply a cap between the 250 and 350 foot levels. At the close of the year 1896 the Swansea shaft had reached a depth of 600 feet with a good reserve of pay ore in sight, and the stockholders had received in less than twelve months five dividends of \$5000 each. There are seven levels in the mine and over 3500 feet of development work. The vein, which is perpendicular with a north and south strike, is from two to six feet wide. The ore is argentiferous galena and iron pyrites, assaying from 50 to 70 ounces in silver, 15 per cent lead with 10 per cent. excess of iron, making it a most desirable ore for the smelters. Thirty-five men are regularly employed. The silver-lead ores with low values in gold seem to predominate in the porphyry. The Swansea Mining Co. is incorporated with 100,000 shares, of a par value of \$5 each.

From the penetrating of the sulphide cap

dates a new era for Silver City and Diamond. During the last six months of 1896 there was a healthy and substantial growth in each of the pioneer settlements. At Silver, as it is familiarly styled, every old building was speedily rejuvenated, many new structures erected and to accommodate the rush of daily arrivals numerous tents were pitched until they could be replaced by something more durable. While all this was going on abandoned mines were re-opened, old locations filed upon and new claims taken up, so that the beginning of 1897 found fully 300 miners at work where twelve months before there were, perhaps, less than thirty.

Entering the fissure vein porphyry area by the wagon road from Mammoth Hollow and Eureka, the first mines are the South Swansea and Swansea, a stone's throw to the left of the road at the foot of a low hillock.

They are on the same vein, a strong, well-defined fissure lode which has been traced fully half a mile. On the South Swansea is a new shaft house, almost at the lower end line of the Swansea claim and in easy speaking distance of the fine surface plant of that mine, equipped with a steam hoist, machine shop



DOUBLE CIRCLE, TINTIC LINK, RIO GRANDE WESTERN RY

and sampling room. The shaft is down over 400 feet and together with the four levels an excellent display of ore reserves is shown. In December, 1896, two train-loads of ore were shipped. This is a comparatively new undertaking that under a conservative management paid its first dividend of \$7,500. It is a corporation under the style of the South Swansea Mining company, having 150,000 shares, par value \$1 each.

Among the first of the old properties to display evidences of a new life was the pioneer Sunbeam. There are four claims in the consolidation on which the company has a bond. The main shaft is down over 350 feet and is fitted out with a naptha hoist. There are several other shafts and a large amount of exploitation has been accomplished. The Sunbeam Consolidated Mining company has 250,000 shares of a par value of \$1 each.

In the bygone days, when all the treasure in these veins was supposed to lie up toward the surface and not far below the grass roots, the Yankee Girl made a good record, though at its best it would be small as compared with the big Tintic mines of today. During the past year it was re-opened, development re-

sumed and some shipments made. Active operations are now being prosecuted. There is a strong fissure with a course or strike nearly east and west, almost at right angles to the generality of these veins. The Yankee Girl Mining Co. has 250,000 shares of a par value of \$1 each.

Another of the young companies that has made a good record during the past year, and which has already sent away some car-load lots of ore, is the Four Aces, owning ground to the southeast of the Swansea. The shaft is down more than 400 feet and the hoisting power is a gasoline engine. The Four Aces Mining company has 250,000 shares of a par value of \$1 each. Next to the Four Aces on the south is the Picnic, where a 175-foot shaft is being driven deeper in expectation of tapping the Swansea vein. Still to the south in the heart of Silver City is the Cleopatra, where a shaft was driven through surface wash nearly 100 feet before striking country-wash. It was reported recently that a vein had been caught, supposed to be the Swansea extension. The Silver Bow group is being worked under lease. Primrose is another old timer, which years ago yielded handsomely. Work was begun again last summer and some heavy lead products sent away. Numerous fissures have been brought to light in the Luzerne, near the Primrose, where a horse whim is aiding development. In the Park, next to the Four Acres on the east, the vein turns sharply, forming almost a right angle, part running north and south and part east and west. It changed owners toward the close of 1896 and exploration is under way. East of the Park is the Iron Duke, which has a new shafthouse and the value of the ground is being tested. A force of eight men is at work in the Alaska, where there are several shafts, deepest 120 feet, showing fair-grade ore bodies carrying silver, lead, copper and iron.

To the southeast of Silver City, some two miles or more, is the Tesora, where difficulty has been met with in handling the flow of water. There are one or two other mines near-by where water has come in, but the Tesora is the only one that has tapped an underground. Here there are three shafts, the main one over 250 feet, which is exploring a promising vein. The Tesora Mining company has 50,000 shares of a par value of \$10 each. In the Undine, on which there is a steam hoist double-compartment shaft 350 feet, exposing a well-defined fissure, a considerable body of water has also been met with. The Stemwinder, at the base of Treasure Hill, has a shaft down 125 feet and exploration is going forward.



CENTENNIAL-EUREKA MINE AT EUREKA.





MAMMOTH MINE AT MAMMOTH.

At different points of Tintic are found ores of all the metals ordinarily required in the arts, sciences or for industrial uses. The Black Dragon, or Dragon Iron mine, situated something more than a mile east of Silver City, is one of the marvels of the camp. It is an immense deposit—a contact over 100 feet thick—of excellent hematite, which is quarried for the smelters treating ores of the precious metals. There being no iron furnaces in Utah, this is now its only economic use. There are shipped daily from three to five cars of about twenty-two tons each. The ore bed is reached by a tunnel over 100 feet long, through which wagons are driven, and inside the quarry there is ample room to turn round and back up against the face of the ore, where the teamsters load. They are paid seventy-five cents a ton for hauling and unloading on the cars. Before this revival of mining this hematite traffic, employing ten men, was almost the sum total of the business of Silver station. Besides the iron bed there is the Black Dragon lead silver mine, in which a flattering discovery was recently made in the opening of a seam carrying free gold, which served to attract fresh attention to this locality. On the same lode is the Governor, where lessees are mining. The vein is strong, the ore contains gold, silver, copper and lead.

Ordinarily the entire area of the porphyritic country-rock is spoken of as the Silver City portion of Tintic, in a measure due to its being the nearest railroad station and similarity of country. Treasure Hill, a mountain in miniature, forms the dividing landmark, Diamond settlement being just beyond, distant about a mile south and west from Silver City. Owing to recent profit-paying shipments the Homestake, on the Diamond slope of Treasure Hill, is occasioning interest. The shaft is down 300 feet. Mining the past year was prosecuted by a horse whim, but at this writing a steam hoist has been erected. The ore is a heavy, black copper oxide carrying gold and silver. The property consists of some ninety acres. Homestake is not a new mine, and the ground yielded well during the 70's. The Homestake Mining company has 400,000 shares of a par value of \$1 each. North of the Homestake is the Shoe-bridge Bonanza, an old favorite that is pushing development to a marked degree of perfection. It is looked upon as a coming property.

A second ancient Treasure Hill bonanza is the Morning Glory, next to the Homestake. Within the past year it has sent away 200-ounce silver ore to the ton, besides values in gold and copper. Much of the ore carries an excess of iron. A new shaft now being sunk is a working incline, and all told probably more ground has been opened in this than in any near-by property. Indications point to regular shipments.

Another recent shipper is the Buckeye, a property made up of five adjoining claims, on which there has been considerable development. The main shaft, fitted out with steam hoist, is down 300 feet and water was struck some months ago. Exploration is being advanced to good purpose. In the Eva well-directed prospecting is on foot in anticipation of cutting a strong vein. Lessees are energetically testing the values of the Showers group of five claims.

A group of the world's great mines are bunched on either mountain slope that shuts in Eureka, a prosperous town of 2,700 population, the metropolis of Tintic. Its streets wind along the bottom of the gulch like the general type of mining towns; altitude about 6,500 feet. The fourth location made in the district was the Eureka lode claim, recorded February 28, 1870, now owned by the Eureka Hill Mining company, which gave the name to the town, the mountain on which it is situated and the gulch below. Eureka is a model, orderly, well-conducted mining town that holds its own favorably as to character of buildings and up-to-date improvements with like towns of larger population. There is no complaint of hard times and it would be difficult to point to a mining camp where general business is more evenly prosperous. Eureka's ore and concentrate shipments for



BULLION-BECK MINE AND MILL AT EUREKA.

1896 were exceeded by but one camp in the Rocky Mountains.

On one side, to the south, is seen the Eureka Hill shaft-house, above it is the huge Packard combination mill, the two connected by a double-track tramway, and higher up the mountain side the Centennial-Eureka group of buildings; on the town level is the shaft-house and business-like structures of the Bullion-Beck, while high to the north, directly above and tied to the shaft-house by a long, steep double-track trestle, is the big Bullion-Beck concentrating mill, and to the east, in the almost perpendicular mountain face, the Gemini shaft-house.

As previously explained, in this northern part of the district the country-rock is limestone, the strata standing almost vertical, while the paying products occur in zones or channels—generally in blue, dolomitic or magnesian limerock—having a course about north and south, and in the main conforming with the stratification. The gangue, or waste forming the ore matrix, is mostly quartz, stained blue and green by copper carbonates, which discoloring is characteristic. Some of the ore bodies are in places 350 feet wide. The values are in gold, silver, copper and lead, each varying in amount and only

occasionally are all found in the same ore body.

The Eureka Hill and Gemini are close corporations and but little information is furnished. The Eureka Hill joins the Gemini on the south, the Bullion-Beck on the east and south, and the Centennial Eureka on the north. Its main double compartment shaft is down 1,100 feet and there are fully twenty-five miles of track on levels and drifts. Five machine air drills are employed in prospecting. About 110 men are at work and the daily output is 150 tons. Underground immense chambers have been excavated and the deepest exploitation shows no evidence of exhaustion. Under the present regime, dividends amounting to \$1,700,000 have been paid. The Eureka Hill Mining company has 10,000 shares of a par value of \$100 each. In the Gemini the deepest workings are 1,200 feet below the collar of the shaft. There are eleven levels and abundant development accomplished. There is a large supply of good milling ore in sight. This is the newest of the "Big Four." It was formerly known as the Keystone. Sum total of dividends, \$825,000. The Gemini Mining company has 5,000 shares of a par value of \$100 each.

The bulk of the mineral brought to the surface from the Eureka Hill is non-shipping low-grade, from which eighty per cent. of the metallic values is secured by the old Washoe pan amalgamating treatment followed by concentrators. These mill products carry two to four dollars gold, eight to twenty ounces silver to the ton, with three per cent. in lead, caught on the vanners. A double-track tram, 700 feet long and 200 feet vertical height, conveys the ore from the shaft to the breaker at the top of the mill at a cost of four cents per ton. This up-hill handling, so contrary to custom, is necessitated by local conditions. From the moment the ore leaves the mine till the concentrates are gathered and the tailings are discharged, the handling is entirely automatic. There are 100 900-pound stamps with a seven and one-half inch drop and 100 drops to the minute, the pulp passing through a forty-mesh screen to Frue vanners, of which there are thirty of the six-foot pattern. Half of the saving is accomplished by the vanners, six or more tons of ore making one ton of concentrates. The tailings from vanners are diverted to Washoe pans, where the charge remains eight hours, thence into settling tanks from which the amalgam is obtained. The mill is a very large structure, the longest dimensions being 200 by 150 feet. Water for mill and mine is obtained by an independent pipe line from Homansville, where several deep wells and shafts were sunk in the porphyritic country-rock, besides much drifting to tap different water courses. The company's surface plant is most complete, even to an iron foundry, where wheels for the



MAMMOTH MILL AT MAMMOTH.



cars and other castings are made. All the cars used in the mine are also built on the ground. The largest producer of all Tintic is the Bullion-Beck. Its history dates from the summer of 1870, when John Beck posted a location notice on what was considered a barren piece of ground. He is today the president of the company. The mine's double-compartment shaft is down 900 feet, from which level a winze has been sunk 100 feet, making greatest depth 1,000 feet. There are nine levels, and the development aggregates eighteen miles. Daily output consists of 100 tons of smelting ore loaded directly on railroad cars at the mine, and 200 tons of milling. The largest chamber stoped out extends from a point eighty feet below surface to the 800 foot level, varying in width from forty to sixty feet. Ore averages fifty five ounces silver to the ton, twelve to fifteen per cent. lead; practically nothing in gold. The realty consists of twenty claims stretching over a mile in length and from 600 to 1,000 feet wide, covering the main perpendicular zone, running north and south, roughly conforming to the bedding planes of the country-rock. Ore is mostly confined to the blue lime. Prospecting in virgin ground is prosecuted by the diamond drill. The company's concentrating mill, a model of its kind, was built two years ago. Like the Packard it is on the mountain-side above the mine, the double-track trestle to the top of the mill being 600 feet long, elevation 200 feet. Cost of landing mineral from shaft is three cents a ton. The plant is made up of a "D" Comet and two Dodge crushers; three sets of Cornish rolls, grinding to quarter-inch; six double jigs, from which the middlings are reduced to 35-mesh in three Bryan mills, thence passed over vanners of which there are ten Frues and five of the Johnson make. Concentrates from jigs and vanners are dumped together, mixed and shipped. The mill's greatest length is 250 feet, 175 feet at widest part and five stories high. More perfect automatic handling of mineral and discharge of waste hardly seems possible. In mine and mill 230 men are employed. The company also built and owns the plant operated by the Homansville Water company, which supplies Eureka with water, as also the requirements of the Bullion-Beck. For the town supply 100 gallons a minute are pumped. Bullion-Beck dividends to January, 1897, foot up \$2,250,000. They are paid monthly, never less than \$30,000. In February, 1897, the stockholders were paid a dividend of \$100,000. The Bullion-Beck Champion Mining company has 100,000 shares of a par value of \$10 each.

The contest in the courts between the Bullion-Beck and the Eureka Hill companies continued for two years, the first action being brought by the Bullion-Beck in January, 1885, in the form of a complaint filed in the District Court of the First Judicial District, Territory of Utah, County of Utah, setting forth an act of trespass on the part of the Eureka Hill in going beyond its ground into Bullion-Beck territory and extracting and taking away large quantities of ore therefrom, amounting "to 2,000 tons of a value of \$75 per ton." In answering, the defendants made a countercharge and cross-complaint, setting up the apex rights of the Eureka claim, it being the senior location of the camp, thus completely turning the tables on their adversaries, and when at last the case came on to be heard, on the new points at issue, the original plaintiffs became defendants and vice versa. At the trial each side had a strong array of expert and legal talent and every

step was hotly contested. In this first suit the extra-lateral apex rights won a signal victory, and, on appeal, the Supreme Court of the Territory upheld the ruling of the lower court. Afterward, there was a compromise establishing a dividing boundary between the two properties, across which neither is to mine. Before the litigation reached its height all the Bullion-Beck property might have been purchased for \$150,000, a proposition of this import being made to and declined by John Q. Packard, the principal owner of the Eureka Hill. Since then this ground has produced over \$2,000,000 net profits.



I TAIL MINE AT EUREKA

The Centennial Eureka is the largest compact connected body of ground owned by one company, some 160 acres, extending on both sides of the ridge between Eureka and Mammoth Hollow. The main two-compartment shaft is down over 1,500 feet and there are thirteen levels, aggregating with the drifts, fully twenty miles. Shipping products run from 40 to 250 ounces silver and \$10 to \$16 gold to the ton, the average being about sixty ounces silver and \$14 gold. A large amount of milling ore, carrying from fifteen to thirty ounces of silver and \$10 gold is stored on the dump and piled away under ground. About fifty tons is the daily shipment, the aim being to send away just sufficient to meet the monthly dividend of \$30,000. Some of the richest ore ever found is being taken from the lowest workings. Dividends paid to January, 1897, make a total of \$1,950,000. The Centennial-Eureka Mining



EUREKA-HILL MINE AND MILL AT EUREKA

Company has 30,000 shares, of a par value of \$50 each.

Promising exploration is on foot in the Red Bird, Carolina, Snowflake and other neighboring properties. There are also many engaged in prospecting round about Eureka.

On the further side of the range to the south of Eureka, but a little more than a mile away, half way down the slope, a wide dry gulch leads to the east, and running westerly, that is known as Mammoth Hollow. The highest peak in this dividing mountain is named Mammoth, there is a town near the head of the gulch named Mammoth, likewise the deepest mine in Utah is here, and is also

named Mammoth. Mammoth town must have had its start soon after the organization of the district, as indicated by the date of the Mammoth lode claim, the third to be recorded. The old town consists of two steep, crooked streets and a cluster of frame houses, where reside most of the 350 miners working nearby. At the lower end it blends into another settlement, Robinson—after George H. Robinson, who has done so much to advance the recent industrial prosperity. The railroad station is at Robinson and is called Mammoth, distant a mile from Mammoth proper, and the general stores, hotels, boarding houses and the like are near the railroad. Practically the two are one. Mammoth has the most abundant water supply of all Tintic, it being piped from Cherry Creek, over a low ridge to the west, to the top of which it is pumped. The railroad freight traffic at this station has amounted to over \$16,000 in one month, which tells something of Mammoth's business thrift.

On the ridge around Mammoth Hollow, and in the different draws running down to the main gulch, an admirable opportunity is afforded to study the rock formation. The strata stand out in bold relief. There are seen the white and blue, or magnesian limestones, ridges of quartzite and the rock masses where they blend, showing the different angles of pitch, most nearly vertical. During the season of 1896 the first geologic survey of the region made by the United States was begun. It embraces an area of two by four miles. The field work last summer was to obtain data for a topographic map, to be followed later by a setting forth of the geology proper. This is a much-needed undertaking of great economic worth.

The workings in the Mammoth Mine are the deepest in the state, 1,850 feet. There are more than twenty miles in levels and drifts. Mammoth is practically a gold mine. For a long period, the metallic extraction averaged gold eighty-six, silver ten, lead and copper four per cent respectively. Galena in places occurs. In December a large ore chamber was opened at the bottom of the mine that in one place carried a strong seam of galena and in another one of exceeding rich gold ore. A cave, sixty by forty feet and twenty feet high, was recently broken into at the 1,350 foot station, northwest from the shaft, the sides, top and bottom one mass of ore. Smelter shipments vary between wide limits, from five to fifty cars a month. They were light in 1896, but this year will show a considerable increase. The great bulk of the mineral is low grade, and to work it, the company built a mill three years ago similar to the Packard, though copper plates are used below the stamps, where thirty per cent of the saving is made in the amalgam. Since first erected its capacity has been doubled and there are now sixty 1000 pound stamps, with a seven-inch drop and 105 drops to the minute, the pulp passing a thirty-five-mesh screen. From the plates the ore goes to the vanners, of which there are thirty-six Frues, the concentrates effecting thirty per cent of the total savings, the other forty per cent being made in the Washoe pans. Crushing is done at the mine, the ore being delivered to the mill, over a mile away, by the New East Tintic Railroad, which has its lower terminus at Mammoth station, from whence smelter shipments are made. The length of the New East Tintic is two and a half miles, and it is planned to soon extend it to the mines beyond the Mammoth and Ajax; grade six per cent; motive power and rolling stock consist of one Shay engine and



four ore cars. Tariff on supplies up or ore down is thirty cents a ton; daily traffic, 250 tons. It is an incorporated company and for the investment a money-making railroad. An addition is being made to the mill for more Washoe pans and agitators, when it will have thirty-six and five respectively, and the daily capacity will be increased to 300 tons. The Mammoth Mining Company has 400,000 shares of a par value of \$25 each, and has paid \$1,150,000 in dividends.

Joining the Mammoth towards the east is the famed Coperopolis, now known as the Ajax. Like the Mammoth it was opened by a main tunnel, in 450 feet, and from the face of the tunnel a double-compartment shaft is down 400 feet. There are four levels and fully 6000 feet of development. Some copper ore, going twenty to thirty-five per cent, is being mined. Average smelting products run \$25 to \$30 gold and fifteen ounces silver to the ton, with four to six per cent in copper. Daily shipments from thirty to fifty tons. At places the ore bodies are sixty feet thick. This mine is to be credited with dividends of over \$1,000,000. The Ajax Mining Company has 300,000 shares of a par value of \$10 each.

At the present imperfect stage of exploration of this part of the district, the number of separate mineralized channels is not known, though it seems evident there are three.

Next in order comes the Sioux, a prospective bonanza that is making a fine record. The Sioux and Utah, operated under one management, have exposed an ore zone for over 3,000 feet. The main tunnel is 1,100 feet, ore found 400 feet in. Development all told is in excess of 6,000 feet. The ore runs higher in silver and lower in gold than the Mammoth, average value about the same. A sixty-ton mill is owned by the company; twenty stamps, twelve vanners and fourteen pans for handling low grades. It is near the Mammoth mill and of the same method of treatment. The Sioux Consolidated Mining Company has 100,000 shares, of a par value of \$10 each. A cross-cut tunnel, starting from the north corner of the Ajax territory, is being driven east under the Eureka Consolidated property and Sioux Company's mines, and will tap these ore bodies 1,250 feet deep. It is owned by the Tintic Mining and Development Company, with principal office in New York City. It is a double track tunnel, ten feet wide and eight feet high, in 1,600 feet, and when completed will be 6,000 feet long, and will furnish an outlet for the ores from the central and eastern zones, Mammoth Mountain.

Numerous prospecting enterprises are actively on foot about Mammoth Hollow. On the north the Emerald shaft is down 400 feet, with 500 feet of drifts, in white lime, searching for the big Centennial-Eureka ore channel, on its continuation through the dividing ridge to the south. This shaft is being sunk another 100 feet. The Emerald Mining Company has 300,000 shares, of a par value of \$5 each. A second venture, exploring to the same end, is the Opex, a ninety-acre tract next to the Emerald on the west, shaft nearly 300 feet, and at the 350 foot station drifting is to be started. The Opex Mining Company has 300,000 shares, of a par value of \$1 each.

Joining the Mammoth on the north, and between it and the Centennial-Eureka is a group of seven claims owned by the Grand Central, where a three-compartment shaft, equipped with approved machinery, is down 740 feet. At the 200-foot station there is a level 1,200 feet long. All told an expendi-

ture of some \$105,000 was made in well directed exploitation before bringing to light the low-grade mineral, of which the property has now a large and well-defined body. Early in the present year, a report was current that a high-grade ore chute had been encountered and today a large force of men is engaged in its development. The Grand Central has 250,000 shares, par value \$1 each.

Like anticipations are promoting work on the Southern Eureka ground, a tract of sixty acres, by a shaft 250 feet deep. To the west of the preceding is the Herkimer, where extensive shafts have been sunk in the country-rock, so far with only negative results. Next to the Herkimer is a lime-quartzite contact that is being tested with a tunnel, and a number of other undertakings are doing systematic prospecting.

East and north of Mammoth Hollow is Godiva Mountain. The "Robinson Boulevard," a fine mountain road from Mammoth to Eureka, girdling the hills to the east, takes in all the mines in a drive of seven miles. But a short year ago this section was under a cloud, many believing it valueless, while today it presents a scene of great activity. Claims then believed to be worthless are now eagerly sought after at rapidly enhancing valuations. This transformation is mainly due to a rich find made last summer in the Humbug, owned by Jesse Knight & Sons. In the spring of 1896 Mr. Knight tried to dispose first of a quarter, afterwards of a half interest in the ground for \$1,000, which sum was to be expended in development, hawking this offer in Salt Lake City, in Provo, where he resides, and elsewhere, but no one cared for it. He and his two sons worked it until some time in August, when their labors were rewarded by the uncovering of an ore body in the face of their tunnel, 200 feet from its mouth. In October the first shipments were made, and have since been regular, exceeding \$100,000 in profits early in January. Much of the ore runs \$150 a ton, averaging \$120, mostly silver, about \$15 in gold, with some galena. North of the Humbug and adjoining it is the Godiva, a former large producer, on which mining has recently been resumed with good results. The shaft is 300 feet deep, and there are three levels on a strong ore body. In character the mineral resembles the Humbug, worth \$60 to \$90 a ton. So far as demonstrated, the Godiva ground is the limit of the producing lime area in this direction. West of Godiva is the Tetro tunnel, in over 400 feet, face in dolomitic lime, but no paying ore. The Tetro Mining Company has 300,000 shares, par value \$1 each.

The Eagle group is west of the Tetro ground, where developing consists of a 500-foot shaft and 1,000 feet of drifting. This work brought forth about \$60,000 in high-grade ore two years ago, soon after which mining was stopped until recently.

To the south of the Sioux is the Northern Spy, an old producer. It will soon change owners. There is a shaft of 500 feet and two tunnels. A small mineralized zone, from fifteen to twenty feet thick, is disclosed, through which are several promising ore seams carrying values in gold, silver and copper. It shipped eleven car-loads, of about twenty-five tons each in 1896. The Carissa has a shaft down 250 feet and is a fair producer. A good property, of which but little is heard, is the North Star, on which the main tunnel is in 500 feet, and from the tunnel a winze has been put down 250 feet. The yield last year was in the neighborhood of

\$50,000, much of it from high grade gold rock. Something has been said of the Black Dragon iron mine, but this is not the only big hematite deposit hereabouts. Whenever Utah has extensive iron furnaces, these beds can supply the demand, however large it may be.

On the dividend account for the past year there was paid \$847,500 by the several incorporated companies, while other mines owned by individuals filed in the office of the County Assessor statements of earnings aggregating \$208,052, or profits of record all told amounting to \$1,055,552. This by no means represents the entire earnings of the mines, as large sums were expended in purchasing additional holdings and in improvements other than in development. Besides it must not be overlooked that when returns of mine profits are made out for the purpose of taxation, generous salaries and no meager incidentals are deducted from the earnings before the figures are finally made up.

No account of the fine surface plants of the mines has here been given, and these certainly should have space in any review of the district, as no better machinery can be manufactured and put together. It is hardly necessary to note that the timbering underground in the limestone area is the Comstock system of square sets, or that the vertical attitude of the mineralized zones most fortunately reduces the pressure to a minimum, otherwise the cost of ore stoping would be increased enormously. In the whole history of mining there is perhaps no region where larger chambers and galleries have been excavated.

The shipments of ore from the Tintic district for 1896 were as follows: Bullion Beck 1,355 cars, Dragon Iron 874, Ajax 424, Centennial-Eureka 374, Eureka Hill 60, Sioux 94, Swansea 110, Gemini 102, Utah 96, Humbug 58, North Star 54, South Swansea 48, Carissa 38.

A smaller number of carload shipments were made by Noon-Iron, Buckeye, Northern Spy, Sunbeam, Godiva, Four Aces, Sowers' Consolidated, Morning Glory, Homestake, Red Rose, Lake View, Annie Laurie, Deceiver, Yankee Girl, Tesora, King James, and Little Willie, a total of 3,919 carloads.

The concentrates shipped aggregated 957 carloads, making a total of 4,876 carloads of ore and concentrates. New discoveries are continually being made, and Tintic will unquestionably show a production in 1897 that will clearly prove the value of modern mining methods, and demonstrate that the ore deposits in Utah grow larger and better as depth is attained instead of becoming valueless, as some of the miners in the early days supposed.

The Rio Grande Western Railroad, with its usual enterprise, has projected lines into the Tintic district, and has by far the best facilities for accommodating the public, not only in reaching Tintic but all the mining camps of Utah. Any communications addressed to the Rio Grande Western, at Salt Lake City, concerning the resources of Utah will receive their attention.

The following was taken from a Mexican financial journal: "Mexico's great banks, running along smoothly and prosperously, indicate that this country has sound financial ideas. The Government is not experimenting in currency theories, is not fooling with the tariff, but goes on its way prudently hence the confidence felt by all our financial and business people in the permanence of favorable conditions."



## SEMI-CENTENNIAL CELEBRATION.

We quite agree with the suggestion of the *Herald* that a semi-centennial exhibition should be held in Los Angeles of the discovery of gold in California, which occurred on the 9th January, 1848, at Sutter Fort. It was an event in the history of the world, and the production of gold immediately thereafter was the most remarkable known in modern times. California is the greatest gold producing state in the nation, and it is fitting that its discovery in considerable quantity should be commemorated, and it should be in this city, as it is the most active and enterprising place on the Pacific Coast. Under the policy now prevailing, gold possesses more power than any other material produced by nature, and it will maintain its pre-eminence until silver is accorded a position which it deserves.

## CORRESPONDENCE

## CALIFORNIA

BANNING, CAL., May 25, '97.

EDITOR JOURNAL.—The mining camp of Twenty-nine Palms is coming rapidly to the front, and bids fair to be one of the most promising and fruitful gold-mining centers in Southern California. A ledge, varying from 2 feet to 31 feet in width, and extending a northwesterly course more than sixteen miles, is a factor in bringing this camp to the attention of the mining world.

For many years it has been known that the best and most water to be had on the Colorado Desert could be found at Twenty-nine Palms, and all travelers or freighters going to Virginia Dale, or east toward the Colorado River, passed over the desert road via Twenty-nine Palms, camping there for rest and water, filling barrels, tanks and canteens, before leaving that favored spot for the hot, dry and drear waste that lay between them and the Colorado River—hence, it has been for many years a noted camping ground.

The land around these Springs was surveyed by the government as far back as 1852.

A few months ago, parties in San Francisco and Los Angeles, believing in the future of Southern California as a promising field for legitimate mining, decided to investigate the matter, and to carefully examine the country in various localities on the Mojave and Colorado Desert. One of their number who had many years' experience started out on a tour of exploration.

Many localities and various places on the Mojave Desert were visited, and then several trips were made out eastward from Banning in the mining districts of the Colorado Desert. Virginia Dale and other points in that vicinity were examined with care, and in many places what appeared to be good ledges were found and any number of prospects visited, in fact that whole section of country was apparently a net-work of veins or ledges of mineral, and location monuments were thicker than grass blades in the blue grass regions of Kentucky. In the mountains, just south of Twenty-nine Palms, many ledges were found and some of them, so far as surface indications could be taken, were quite promising. North of Twenty-nine Palms, the country seemed to be in a better and stronger formation, and some very strong veins were found.

After a careful examination of an area of country, covering several hundreds of miles, and several weeks in time occupied in so

doing, the party decided to locate in that section of country near and adjacent to Twenty-nine Palms. Accordingly, last November, a purchase of several mining claims, as a nucleus for further interest were made, some south and some north of Twenty-nine Palms, and a headquarters camp established at that point. At that time but two parties received their mail at Twenty-nine Palms, and no mine work, aside perhaps of a little prospecting was being done in that vicinity.

The wagon freights from the railroad station to this point were \$25 per ton and six days required to make Banning the then nearest railway station, on a round trip for freight, and two and a half days' time were required to reach Los Angeles from the camp. At this writing, only about six months having elapsed, about forty people get their mail at Twenty-nine Palms.

A stage line has been put on by Messrs. Kinney & Willess, from Palms Station, on the S. P. Railway to the Twenty-nine Palms country.

One may leave Los Angeles at eight in the morning, by the Southern Pacific, taking the stage at Palm Station a little after noon hour, reaching Twenty-nine Palms Station in the heart of the rich gold mining country at eight p. m. the same evening.

Wagon freights have been reduced to \$12 per ton. A post office has been applied for, an express and postal line established by the stage company, all of which make the citizens of Twenty-nine Palms feel that the wheels of progress are moving. That they are right in this view of the matter, the great increase of business interests would seem to prove.

Among the more prominent are the Desert Mill and Mining Company, a corporation recently formed, composed in part by several leading business men of Los Angeles. They have a new Tremain stamp mill erected at Twenty-nine Palms, having a capacity of 12 tons per day. The mill commenced work on the 10th of May. This company have some valuable property, which they will fully develop and work.

The San Francisco parties also have a two-stamp mill on the ground and in course of erection at Twenty-nine Palms, for the purpose of testing their ore. They also have contracts out for a large plant to be erected about September 1st. In San Francisco, this past week, these gentlemen incorporated the Caro Mining Company, with a capital stock of \$250,000—par value of shares \$1.00 each. Officers of the company are: F. S. Samuels, president and treasurer; Irvine Steuart, secretary, and J. J. Smith, vice-president; J. L. Mudge, general manager.

This company now controls some forty odd properties, having followed a steady, careful prospecting system—there being about 650 feet of shafts, drifts and tunnels on some five different claims.

A great deal of time has also been spent in prospecting for and locating water, with most satisfactory results. A boring outfit was adopted that could be easily worked, and water has been found or located in several places—thus proving that there is plenty of water for mining purposes on that portion of the Colorado Desert.

As has been afore-mentioned there is plenty of wood to be had by simply uncovering it. It has been ascertained that the so-called sand dunes or hills were nothing more or less than a store house for wood.

From all these facts, considering the great advantages of wood and water, the apparently

inexhaustible deposits of mineral in and around Twenty-nine Palms, we think that the miners of that locality have good reason for believing in the prosperous future for Twenty-nine Palms.

## MEXICO.

MEXICO CITY, May 16, '97.

Mr. George Ames, proprietor of the Union Iron Works, of California, spent a few weeks in this city, making new arrangements in regard to the handling of mining and other machinery in this republic. Mr. Pennock, their former agent, having resigned his position, the agency will hereafter be in charge of Geo. A. Ames, jr.

Mr. M. P. Boss, of the Boss continuous process fame, who makes his headquarters in this city, has just ordered 15 new Union concentrators from the Union Iron Works. A great many of these machines have of late been installed at various mines, long distances from the railroad, for the treatment of low grade ores that will not bear transportation in the crude state, and they have given universal satisfaction.

Mr. James A. McClurg, the son-in-law of Dave Moffit, the Colorado Mining King, spent several weeks in this city with a view to closing a deal for the purchase of a large group of gold mines in the state of Oaxaca. Mr. McClurg was favorably impressed with the business future of this country, and left more convinced than ever of the present and future prosperity of Mexico on a free silver basis. He found living cheaper in this country than in the United States, and that a dollar Mexican silver goes just as far in purchasing the necessities of life here as a gold dollar does in the States, and as for good cigars and tobacco he expressed his opinion that the States were not in it.

Mr. Taylor, the representative of the Utica Mining Company of California, has been at El Oro mining camp, in the State of Mexico, and expects to make a deal for the purchase of the Esperanza and Anexas mines at that place. There is at present a 40-stamp mill in operation on this property, and 60 more are in process of erection. This company is paying regular monthly dividends, and claims to have eight million dollars worth of ore blocked out in the mines.

A valuable copper mine, located a few kilometers south of Jimenez, in the State of Chihuahua, was recently purchased by Messrs. Guggenheims, the owners of the Monterey and Aguas Calientes smelters in this republic. The price paid was \$150,000 Mexican silver. The mine will be thoroughly worked and the products shipped to their Aguas Calientes plant, where a specialty of copper smelting is made.

Mr. Thomas J. Ryder, formerly connected with the Kansas City smelter at El Paso, Texas, is the present manager of the Aguas Calientes plant.

Mr. C. A. Martine, the representative of a Denver syndicate, has been investigating mines in the State of Guerrero. This State is one of the richest in the republic. Copper, lead, silver, gold and antimony deposits exist in unlimited quantities, but the development of these valuable deposits has been retarded in the past on account of the lack of railroad facilities. The completion of the Cuernavaca road will bring the mining industries of this state to the front. Mr. A. J. Elian, the noted millwright, who has erected several large



plants for Fraser & Chalmers in this country, is at present in this city from the mining camp of Tasco, in the State of Guerrero, where he is engaged in the erection of a 50-ton concentrating plant for Noriega Bros. of this city. He reports great activity in Tasco, in expectation of the railroad reaching that point in a short time.

Messrs. Heckelmann & McCann, assayers and metallurgists of this city, have completed arrangements for the erection of a testing and sampling plant in the City of Mexico. The plant will be equipped with the latest American machinery for making practical working tests on ores by all the best known processes. There is no plant of a similar nature in this republic and heretofore all ores on which working tests were desired had to be sent to the States, entailing long delays and great expense.

Mr Ferdinand McCann, a graduate of the University of California, who has had many years' experience in Mexico and the States in working ores by the best known processes, will be the metallurgist in charge, and Mr. Otto Heckelmann, formerly engaged in the assaying and sampling business at El Paso, will officiate as manager.

## Miscellaneous Mining News.

### CALIFORNIA.

#### AMADOR COUNTY.

The first load of machinery for the new hoist to be erected on the Kennedy mine at Jackson arrived May 20th. The foundation for the works is nearly completed.

The shaft at the Oneida mine, near Jackson, is fast reaching the 1000 mark. It is now down about 950 feet. The rock is not breaking as well as they would like, but still it is better than it has been.

The north drift in the Anita mine of Jackson is now in over 400 feet and the work in it is still progressing toward the Shober ore chimney, which will probably be encountered in the neighborhood of 500 feet. Ledge matter has been encountered the entire distance.

The excavation for the 40-stamp mill at the Argonaut, in the vicinity of Jackson, has been completed and the work of putting in the foundation was commenced last week. It is 40x86 feet on the ground. The foundation is of concrete and one-half of it is to have a concrete floor.

Superintendent S. R. Porter made a very creditable showing at the Balliol mine, at Sutter Creek, during April. The 40-stamp mill crushed 585 tons of ore at a cost of 60 cents per ton for mining and milling. It was delivered in the mill at 33 cents a ton. The clean-up for the month was quite satisfactory, and it may be interesting to our readers to know that the bullion paid \$18 per ounce. This week the mill rock feeders broke and necessitated closing down. Knight & Co. repaired the damage and the mill is running again. We believe the record of 60 cents per ton made for mining and milling ore at this mine last month is the lowest figure ever reached in the State.

#### CALAVERAS COUNTY.

Ira Hill Reed, F. J. Solinsky and Mary L. Reddick have bonded their interest in the Lafranchi mine at West Point to John A. Paull. The bond is for one year and the amount named is \$3000.

Operations have been resumed on the Lone Star and Ketz mines at West Point, and there is also considerable prospecting being done.

#### INYO COUNTY.

Up the canyon from Ballarat, which is 65 miles south-east from Keeler, the Mammoth Co.'s mill comes first. The plant consists of a Bryan mill, capacity 15 tons daily; a cylinder amalgamator, and two concentrators.

Montgomery Bros. are talking of putting up additional working facilities, probably a cyanide plant.

Four miles below Ballarat are the mines of Stotler, Ganser Bros., and others. Some work has been done here, with encouraging results.

Rich strikes are reported as make a few miles north of Shepherd's canyon.

Good reports come from Junction and the Coso range.

The Argus Mining Co. are talking of adding a smelting plant to their cyanide outfit.

The Anthony mines are now idle, owing to complications over bond matters.

In Tuber, Goal and Happy canyons very good prospects have been found. Jack Curran's mine in Goal canyon is believed to be one of the bonanzas of the coast.

J. J. Gunn's Minnietta mine is looking well. The ore now taken out is almost free milling silver, instead of the high grade galena heretofore produced.

At Modock, Frank Fitzgerald has struck ore in new ground, and there is every indication that the new find will prove equal to any of the old Modock bonanzas. The ore is high grade galena.

The Inyo Development Co., now owning the Lane mining property near Darwin, is preparing to put up a 20-ton smelter. When this is built, it will be in the market for custom work on either wet or dry ores.

Harry Bros. have recently made a shipment of ore.

Jim McDonald is in charge of the Defiance property. This well known mine is showing up in fine shape. *Inyo Register.*

#### KERN COUNTY.

Frank and Charley Adams are in from their mines at Randsburg. The boys say that they are doing fairly well, working some leased property, and have some good claims of their own.

The work of sinking a new shaft on the Little Butte has been commenced. Work on the old shaft still goes merrily on.

Work on the main shaft of the St. Elmo mine has been discontinued for the purpose of putting in a hoisting apparatus. This will require some ten days or two weeks, when operations will be renewed with a larger force of men. Another shaft has been sunk to a depth of 50 feet, from which some very rich ore is being taken.

The survey for the pipe line from Desert Springs was completed last week, and the active work of bringing water to Randsburg is to begin at once.—*Bakersfield Echo.*

#### MONO COUNTY.

At the annual meetings of the Goleta, Montecito and Sterling Mining companies, whose mines are in the Jordan district, in this county, held the 5th ult., the following officers were elected for the ensuing year: Directors—Stephen Roberts, President; O. V. Walker, Vice President; George R. Williams, R. Hawkshurst, W. R. Smedberg. The Directors re-elected D. M. Kent, Secretary, and M. G. Rhodes, Superintendent.

#### PLUMAS COUNTY.

From Fred Scott who was over to Quincy from the North Fork last week the *Plumas National Bulletin* learned that the present year will be one of greater activity among the mines in that part of the county. The indications are that more gold than usual will reward the miners for their efforts.

On the Scott drift mine a small force of men are employed and good results are being obtained. This mine is a part of the Big Flat channel, which, at points in the Scott mine, is very wide.

Below this is the San Jose location, owned by Hugh Kelley, who is driving a tunnel to open up the channel.

Angus Cameron's mine is just above the Scott property. Mr. Cameron has several men employed and is understood to be taking out good pay.

A force of men is employed in driving a new tunnel into the Glazier to tap the channel at a greater depth than was done by the first tunnel. The new tunnel is now in about 100 feet. The Dunn Bros. have a good quartz development near the head of the Glazier gravel mine. The ledge is of fair size and yields rich prospects.

#### SAN DIEGO COUNTY.

There are two districts which are turning out bullion—Julian and Hedges—and a third, Picacho, will soon be added to the list.

The Julian district is 55 miles northeast of San Diego. It has nine quartz mills with a total of 90 stamps. Three mills are running most of the time. About 20 mines are being operated. The ore is free milling quartz, carrying gold.

The Picacho district is on the Colorado river. Development work has been so encouraging that Hon. Stephen W. Dorsey, who represents a large syndicate, has arranged for the erection of a 100-stamp mill. Col. D. K. Allen is one of the largest operators in this district. The ores are free milling quartz carrying gold.

In 1894 San Diego county produced \$266,408.73 gold; \$189.60 silver; total \$266,598.33. In 1895, \$344,307.57 gold; \$600 silver; total \$344,907.57.—*San Diego Progress.*

#### TOLUENE COUNTY.

The New Era, owned by Holland and Trewartha, will be put in working order this summer, and started up with entirely new machinery.

Manager W. G. Long is making the Gagnere show up beyond the company's most sanguine hopes. It promises to be a star.



Everything is bustle about the Omega. A boarding-house has just been completed, and other work is going on preparatory to opening up the mine in good shape.

Superintendent Moorhead is making the App keep up its enviable reputation as a producer. The main shaft is down to the 900 level, and still sinking with a strong 25-foot vein of standard quartz in the bottom. The mill is being fed from ore taken from the slopes of the 800 level. Other work under ground is done, and the mine never looked better than it does today.

The main shaft on the Black Oak mine has reached the 800-foot mark, with a big body of fine ore in sight. Drifting still continues north and south on the 700 level, and the main portion of rock reduced still comes from those points. The regular shipment of 200 tons per month to Selby's keeps up regularly, with accompanying satisfactory returns. The work of putting on the additional ten stamps to the mill and the erection of the cyanide plant is being hurried along as fast as possible.

The main shaft on the Rawhide mine has just reached the 1,100 level. It will be continued right along to the 1,290, when cross-cutting and drifting will be commenced. Later on the shaft will be run down still another hundred feet. Work is also being pushed on to the north drift of the 800, but the ore which keeps the 40 stamps dropping comes from the slopes between the 1000 and 900; the 900 and 800. The mine is superb, showing 30 feet of high-grade rock. It has not yet been decided whether a cyanide or concentrating plant will be put up, but probably the former will be adopted as Captain Nevills has sent to Africa for plans of the great Robinson plant, known as the largest in the world. It is said that under that process a way has been discovered for working both slimes and tailings, something that heretofore has been an impossibility.

A new law of Idaho provides that none but citizens or those who have declared their intention to become citizens may be employed in the mines. Manager Huntley last week notified the aliens at the DeLamar mine to quit or take out their first papers. Most of them declared their intention to become citizens. The constitutionality of the law will be tried in the courts.

Of his recent extended study of the gold resources of South Africa, Dr. Becker says that the Transvaal republic contains the largest gold deposits in the world. Within fifteen miles of Johannesburg there is an amount of gold, practically in sight estimated to be worth \$3,300,000,000, or nearly as much as the entire volume of gold coin now in the world. The gold is extraordinarily uniform, as uniform as coal in an ordinary deposit, as shown by shafts which have been sunk to a depth of 1800 feet, and diamond drillings, which have gone still farther. At present the gold is being taken out at the rate of \$100,000,000 a year.

#### MEXICO.

##### Sonora Notes.

At Bacoachi, in the Arizpe district, the Cerro del Oro Company have erected a number of fine buildings, are putting up a mill and imparted a general sense of life and ac-

tivity to the place. Never before was the town so lively nor so many strangers in the place.

Mr. James Kirk, who is working the Prospect mine, about two miles from Oso Negro, in the Arizpe district, and development has now reached a point which warrants the erection of machinery, so he has bought the Oso Negro mill, a dry crusher with twenty stamps, boiler, engine, etc., and is now moving it to the Prospect property.

The Churibabi mine, about ten miles north of Nacosari, is reported in a very prosperous condition, making regular shipments of bullion. There is a shaft of about 500 feet deep, with considerable other development. A ten-stamp mill is in constant operation. This fine property was once owned by Dr. Brown, formerly post surgeon at Fort Huachuca, and Col Lawton, U. S. A. Its present owners are James Suits, George Riordan, and the heirs of the late S. O. Fredericks of Tombstone.

Pedro Negro has just returned to Nogales from a trip to Pílares, the scene of the recent discovery in the Sierra Teros. He reports that while there is some very rich ore, it occurs only in small deposits, and will be only a chloriding proposition. From Pílares Mr. Negro visited Lampazos mining camp, which he describes as a wonderful region. The veins are in a contact of lime and porphyry, the latter being the foot wall. They vary from three to forty feet in width and their ores are rich in silver. La Mina Grande, belonging to the Malone Bros., of Cleveland, Ohio, and Los Taos mine, belonging to Smith Jackson and Lopez, are both big mines, highly productive. Mr. Negro denounced a new mine there with a five-foot vein, assaying 67 ounces silver and \$1.40 gold per ton. Mr. Negro states that the formation at Lampazos is the same as at Leadville and Aspen, Colorado, and he predicts that it will be a big camp.

Col. Miguel Bornio and Al Peck drove to Nogales from Las Planchas mine Sunday, May 16th, with 800 pounds of silver bullion.

The Planchas mine is a free milling proposition, and the stamp mill is kept busy on rich ore under Mr. Bornio's able management. It is mines like this, conducted by men like Mr. Bornio, that keep Nogales lively all the time.

From his Nopalera mine, near Hermosillo, Mr. L. Labory is regularly shipping about six tons of ore monthly, which yield an average of 250 ounces of silver per ton. Ore shipments are paying the cost of development work.

Mr. J. B. Magruder is arranging to erect a smelter at Las Cruces, on the Sonora River, about thirty-six miles above Hermosillo, in an easterly direction. The plant will consist of two 30-ton water jacket stacks, with all the necessary machinery. Ores will be worked from the Colorado and Los Muertos mines, both having large bodies of low grade fluxing ores. Low grade fluxing ores from other mines will also be bought. Coke will come from Europe by the ship load, and the bullion will be shipped out by the same route. Active operations will begin about June 1st.

The Guggenheim Company have resumed development work upon their copper properties at Nacosari, the reason, it is reported, being that the Copper Queen Company want to have in sight ore to justify construction of a railway before closing the deal for purchase.

#### NEVADA.

##### Southern Humboldt.

At Jersey, Humboldt county, a once prosperous mining camp, not very distant from Kennedy, J. W. Abel & Sons are working on the old Jersey mines and other claims, and are taking out some very rich lead ore, which is being shipped to the smelting works of Selby & Co., San Francisco.

J. G. Ford, J. R. Douglas, H. Robinson, James Barress and Mike Donnelly, of Eureka, are at Jersey, and have a lease on the old dumps, and are working them over by the jiggling process. They have a jig with the capacity of ten tons a day, and are making good wages out of the dumps.

##### KENNEDY.

At Kennedy, J. A. Blossom has several men working on the Gold Note and other claims, which look encouraging. Rich ore is being taken out. Sixty or seventy tons of ore are now ready for shipment.

Joseph Miller and Joseph King are taking out some rich ore from their claim, which they are constantly working, and intend shipping a carload soon.

H. J. Bender has three men working on his mine in Water Canyon, and he, like the other miners there, is taking out rich ore and has a quantity in readiness for shipment.

##### SPRING VALLEY.

J. B. Foltz & Sons have their hydraulic works in operation, and have plenty of water with which to work and are at present washing out some fine ledge gold. Their prospect is looking better than it has for years, and the owners are much encouraged and happier than they have been for many a day.

In the same canyon as the above, W. H. Corbiere is running an underground tunnel to tap a streak and has accomplished 160 feet of work, with the expectation of striking it with 40 feet more. The indications all go to show that the streak will be reached as soon as the 200 feet of tunneling is completed.

There are a few Chinamen working in this canyon and quite a number in Dry Gulch and American Canyon. They are all making good wages.

##### UNIONVILLE.

Neil Carmichael is running his 2-stamp mill and is working some ore, but mostly tailings and cleanings from around where the old mills used to stand, and is making good wages.

##### BLOODY CANYON.

John Taylor is working on his antimony mine. The mine is looking fine. A three-foot vein of antimony was recently struck. Mr. Taylor has a good-paying property now.

##### DUN GLEN.

At Dun Glen everything is very quiet with the exception of a little prospecting which is going on. The mines though are looking fine, and their owners expect to resume work on them this summer.

##### ROCK HILL.

Not very much is going on at Rock Hill, on account of too much water at present, but later on work will begin in earnest on the various good claims.

Last year, Low Yeas, a Chinaman, took out considerable gold in Rock Hill, and will no doubt again this summer.—*Winnemucca Silver State.*



Mason Valley, near Winnemucca, is talking of having a smelter in the near future.

Operations in the placer mines at Rock Hill, near Dun Glen, in Humboldt county, was suspended for a few weeks to repair the large dredger which broke. The mines are paying well and fifteen men are employed.

Lincoln county has a mica mine, and samples taken from it are two feet square and of good quality.

The Peck brothers have completely renovated and altered the old Birdsall mill at Dayton, repaired the railroad in connection with it, and started up steam, and will have the plant running full force in a few days. They expect to run through their mill about 250 tons of tailings daily, and that it will take them about three years to clean up all the tailings they have purchased besides what they have contracted to purchase.

W. E. Price and B. A. Cardwell, of Truckee, bonded a mining claim. It is a lode claim and situated about twenty miles directly north of Reno. The ledge at the surface of the ground is about three feet in thickness. The rock carries gold, silver and copper, and assays, at the surface, \$30 per ton. It is the intention to begin development at once, and Mr. Price will go there for the purpose of starting work. There is now a shaft on the ledge 100 feet deep. From this there will be a crosscut run to see what the ledge is at that depth. If it proves to be as large and assays as well at that depth as at the surface, the gentlemen will feel that they have a splendid mine.

Carson is excited over the rich gold discoveries at Buckeye. Another strike was made this week about a mile from the recent discovery, but in a direct line with the main channel, proving beyond doubt that a channel of extraordinary richness has been found.

It is said that water to work the mines will be brought from the headwaters of the Carson river in Alpine county.—*Genoa Courier*.

## PERSONAL NEWS ITEMS

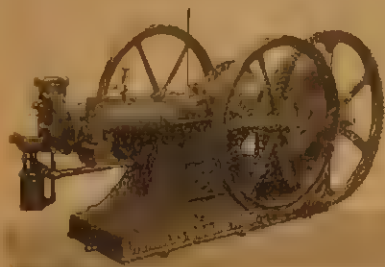
L. Lajeune, the mining man who has been examining some properties near Altar, Sonora, Mexico, has recently gone to Chicago, Ill.

James Dobbins, who is interested in mines near Villa Ahumada, in the state of Chihuahua, Mexico, has left the Villa for a two months' visit to his home in Missouri.

A. Burch, the well-known mining engineer, has been appointed superintendent of the Bunker Hill and Sullivan mine at Wardner, Idaho. Many Eureka, Utah, friends will wish Mr. Burch success in his new place.

George H. Stewart, who is interested in the Aurora mine at the Alamo in Lower California, Mexico, arrived in Ensenada from Chicago, Ill., the 16th ult., to look after his interests there.

William Truax, of the Truax Manufacturing Co. of Denver, Colo., manufacturers of ore cars and buckets was a visitor at the JOURNAL office on the 30th ult.



## Hercules Gas, Gasoline & Distillate Engines

Hoisting Engines 2 to 200 H.P. Stationary Engines 1 to 200 H.P. Marine Engines 2 to 200 H.P.

Our newly designed and perfected DISTILLATE VAPORIZER insures a saving of 50 per cent. on cost of running. Just 1/4 your expense saved by using a HERCULE in place of any other. We make no exceptions.

Nearly 3000 Hercules hoisting, Stationary and Marine Engines in Actual Use. High Grade.

We claim full power, automatic and positive adjustment regulating speed and consumption of fuel in proportion to work being performed. No spring electrodes to burn out. All springs are outside. Points of ignition, speed and amount of fuel can be changed while engine is in operation.

We make a Specialty of Mining Trade. Address **Hercules Gas Engine Works**  
Established 1880  
217 Bay Street, SAN FRANCISCO, CAL.  
Write for Illustrated Catalogue

**ENGINES**  
GAS  
GASOLINE  
DISTILLATE

Cheap. Reliable.  
Weber Gas & Gasoline Engine Co.  
434 S. W. Blvd., Kansas City, Mo.

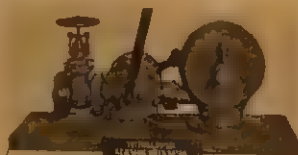


**MISSOURI DREDGE CO.,**  
KANSAS CITY, MO. Placer Mining Dredges a Specialty

## Tutthill Water Wheel

The Best Jet Impulse Wheel in the Market, BARRING NONE.

Wheels, Buckets and Nozzles designed to suit special requirements, when Head and Conditions are Given. Theoretically as well as practically Perfect. Highest Efficiency Guaranteed. Contracts taken for any size plant.



We have a Sensitive, simple and Durable Governor, entirely new and novel, that will positively regulate speed of wheel. Specially adapted for electric railway and Lighting Plants.

**OAKLAND IRON WORKS, BUILDERS,**  
Write for Catalogue

108 First Street, San Francisco  
Telephone 1067 Main

## Ores! Ores! Ores!!

Gold, Silver and Lead Ores and Concentrates

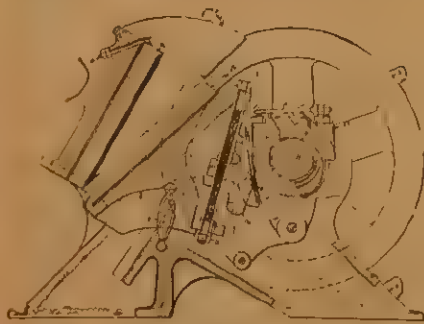
Purchased at Reduced Rates for Treatment.

## Selby Smelting and Lead Co.

416 MONTGOMERY ST., San Francisco

Consign Shipments to Vallejo Junction, Cal.

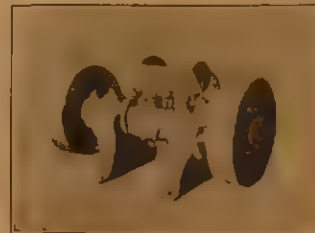
## THE MORRIS ROCK BREAKER & ORE CRUSHER



MORRIS ROCK CRUSHER

IT MAKES A FINER AND MORE EVEN PRODUCT THAN ANY OTHER IN THE MARKET, AND IS PECULIARLY ADAPTED FOR DISTRICTS WHERE FUEL AND WATER ARE SCARCE.

IT REQUIRES LESS POWER THAN ANY OTHER MACHINE PERFORMING THE SAME AMOUNT OF WORK.



MORRIS ROCK CRUSHER

For further information, Catalogues and Testimonials apply to

**D. M. DOUB, General Agt., 137 First St. San Francisco.**



Manager Gladwin, of the Colorado Gold Mining company at Keyville, in Kern county, was in Bakerville, Cal., last week.

Fred Ritter arrived in Winnemucca, Nevada, from Virginia City on the 15th ult. on his way to see some mines at Willow Point.

Mr. Fred Dacos, general manager of the Mexicani Ore Co., spent last week at Santa Rosalia, in the state of Chihuahua, Mexico.

E. S. Richards, who has been on an extensive prospecting trip through the mountains east of here, has just returned home.

Territorial Mine Inspector J. W. Fleming passed through Deming, N. M., the 19th ult., going north on a mine inspecting trip.

J. J. Lonergan, an assayer and mine promoter, and H. C. Beatty, of this city, were in Tucson, Arizona, the middle part of last month.

J. K. Dorrington, one of the members of the Southwestern M. & R. Co. of Chloride, Arizona, recently arrived on the coast from Kingman, Ariz.

J. R. Harrington, son of G. P. Harrington of the Crowned King Mining company, of Prescott, Ariz., left for the east the 19th of May.

Claussen & Gallagher, lessees of the Charter Oak mill at Hillsboro, N. M., have dissolved partnership and Mr. Gallagher will go on an extended prospecting trip through Arizona and old Mexico. Mr. Claussen will continue to run the mill.

Dr. John Grass of Trinidad, who is interested in the Milgros Gold mines, made a flying trip to Albuquerque, N. M., the 20th ult.

C. Y. Schoonmaker returned May the 18th to Winslow, Arizona, from a two weeks' trip to Prescott.

Ed Cooper, who has been sinking a shaft on the Juanita mining claim in the Ladrona district, arrived in Albuquerque, N. M., the 20th of May.

George Whentley, who is a practical mining engineer and fully capable of reporting on mines in a practical and scientific manner, proposes to locate in Los Angeles. Mr. Whentley was recently located at Tucson, Arizona, and has reports and data on a number of mines in Pima and Pinal counties which he proposes to place, if possible, in this city.

John Martin, of San Francisco, Cal., was in Sonora, Cal., the middle of May.

Charley Lewis, a New Mexican mining man, arrived in Kingman, Ariz., from Randsburg early last week. He thinks favorably of the mines of that region.

Capt. Pinder, mining engineer and metallurgist for the Gold Creek Mining company, who recently went to San Francisco, has returned to Gold Creek, Nevada.

A. H. Ward, a mining man of Alameda, Cal., was recently Coulterville looking after his interests there.

Burique C. Creel, of the Compania Industrial Mexicana de Chihuahua, Mexico, left that city the middle of May for a two weeks' visit to New York City.

C. W. Kinney and Luke Kearney returned the 18th ult. from Portland, Oregon, to Winnemucca, Nevada, and will leave in a few days for their mines at Bartlett Creek.

Joseph Spellman, agent of the Chrome Steel Works at Brooklyn, N. Y., was a visitor at the Journal office the middle of May.

H. B. Westover and H. I. Hendly, two mining men of Cripple Creek, Col., are spending a few days in Gold Creek, Nevada, in the interest of eastern capital.

F. M. Bradshaw of Rosendana, Lower California, Mexico, came up to San Diego, Cal., the 19th ult.

John Ballard, one of Captain Nevill's partners in the Rawhide, near Sonora, Cal., arrived at the mine Wednesday, May 10th for a brief stay.

J. J. Horning, of Chicago, has been in Prescott, Ariz., for several days looking over the mining resources of that section.

#### OBITUARY

Ed Scheffelin, who in 1878 dared to venture in the stronghold of the Apache and blazed the trail of progress—the founder of Tombstone, Ariz., died at Canyonville, Oregon, the middle of May.

### Lacy Manufacturing Co.

Manufacturers of

Steel Water Pipe, Well Casing, Oil Tanks and General Sheet Iron Work, Irrigation Supplies, Steel Water Pipe for Hydraulic Purposes.

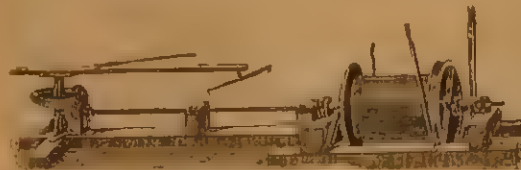
4 BAKER BLOCK.

LOS ANGELES, CAL.

### KROCH MANUFACTURING CO.

Successors to the San Francisco Tool Co.'s Mfg. Dept., builders of Engines and Centrifugal Pumps for Mining and Water Works. These pumps can be operated by horse power, water power steam, gasoline or electric motors.

#### Horse Power



Triple-Acting Pumps, Deep Well Pumps, Cornish and Jack Head Pumps for Deep Mining, Horse Power Mining Hoists, Stamp Mills, Ore Crushers, Ore Feeders, Ore Buckets, Ore Cars, Water Gate Valves up to 40 inches diameter, and Link Chain Elevators, Pipe and Fittings at lowest prices. Hydraulic Presses. We

also manufacture Cyanide Tanks and Centrifugal Sand Pumps for filling and discharging them. The Pumps work the tailings to perfection and are made to handle small or large quantities.

#### OFFICE AND WORKS

51 Beale St. and 9 to 17 Stevenson St. San Francisco, Cal.

### PROSPECTORS! Assaying and Determination of Minerals Simplified at



### LUCKHARDT'S COMBINED ASSAY OFFICE

(Incorporated)

26 O'FARREL STREET, SAN FRANCISCO, CAL.



#### FACTORY:

3101-3141 Blake St., 1742-1746 Champa St., Denver, Col.

#### THE

### Denver Fire Clay Co.

Assayers' and Chemists' Supplies

SPECIALTY—ASSAYING

Ornacles, Scorifiers and Muffles

And all other kinds of

Fire Clay Material.

SPECIALTIES: Strictly c. p. Acids, Test Lead, Bone Ash, Cyanide Potash, Argol, Borax, Borax Glass, Iron Sulphate, Litharge, Soda, Molting Fluxes, etc.

Sole Agents for the Minneapolis Balances

OFFICE:

**VANDUZEN STEAM PUMP**  
THE BEST IN THE WORLD.  
Pumps Any Kind of Liquid.  
Always in Order, never Ours or  
Others. Every Pump Guaranteed  
—10 SIZES—  
200 to 12000 Gallons per Hour.  
Cost \$7 to \$75 each. Address  
Jas Vanforth, 87 Market St.,  
SAN FRANCISCO, CAL.

### B. T. LLOYD

#### GOLD MINES.

Stocks and Bonds

BOUGHT AND SOLD

McCormick Building, Salt Lake City, Utah

B. M. CALKINS

"PHONE "BLACK" 891.

J. J. LONERGAN

### LONERGAN & CALKINS.

## Gold AND Silver Refiners AND Assayers

#### MINING EXPERTS AND PROMOTERS

Miner's Gold and Silver Bought

Also Old Gold and Silver

#### Agents for S. S. LIGHTFOOT SYNDICATE

Cable Address "Lonergan, Los Angeles"

London, England.

127 W. FIRST ST. LOS ANGELES, CAL.

## Assayers and Chemists

### WADE & WADE

Best and Oldest Establishment in Southern Cal.

115 1/2 N. Main St., Los Angeles, Cal.

### AUSTIN BROS.

#### IRON, STEEL, MACHINISTS AND BLACKSMITH SUPPLIES

Iron Pipe, Oil Caps, Lubricators, Bolting, Packing, Lacing, Asbestos Covering, Steam and Water Gages, Shovel and Picks, Railbanks Scales, Braces and Iron Steam Fittings, Etc., Etc.

Stockton, Cal.

### THE CHRYSOMETER.

A CHEMICAL ASSAY OUTFIT. Anyone can use it. Chemicals enough for 100 assays with each \$45 outfit. J. W. PRITTEK, Sole Manufacturer, 607 17th Street, Denver, Colo.

### Cobb & Hesselmeyer,

## MECHANICAL ENGINEERS

Hydraulics, Power, Tests, etc.

421 Market Street, Rooms 70 and 71  
SAN FRANCISCO, CAL.

## An Assay

Will show what is in your ore.....

## A Mill Test

Will show what you can get out of it

## We Do Both

Practical working tests made of ALL CLASSES OF ORES and advice given as to best methods of extracting values. Mines examined and reported on. Twenty years experience with Pacific Coast ores.

## F. M. Johnson & Co.

23 Stevenson Street,

SAN FRANCISCO, CAL.



# LOS ANGELES SEWER PIPE ASSOC'N.

MANUFACTURERS OF

## Fire Brick, All Fire Clay Products, Milled Fire Clay, etc.

For Fire Boxes, Lime Kilns, Furnaces and Smelters.

Also Dealers in English Fire Brick

Special Facilities for Supplying Assayers and the Trade of the Southwest.

649 and 651 S. BROADWAY,

LOS ANGELES, CAL.

## PATENTS!

TOWNSEND BROTHERS  
SOLICITORS  
OF PATENTSPatents on Inventions secured in all countries. Copyrights, Trade Marks and Labels.  
Office, 9, Downey Block.  
Telephone 347. Los Angeles, Cal.

## GOLD

-AT-

## CRIPPLE CREEK.

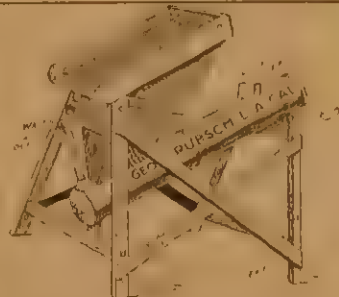
The heart of the Mining District is reached by the Midland Terminal Railway, which is the direct connection of the

Atlantic and Pacific Railroad  
Southern California Railway

Through Palace Sleeping Cars and Through Tourist Sleeping Cars run every day from both San Francisco and Los Angeles to La Junta, Colorado, where immediate connection is made for the

### GOLD DISTRICT

Through Tickets and Sleeping Car Reservations can be obtained at the Ticket Office of the Santa Fe Route

644 Market St., San Francisco  
2d and Spring Sts., Los Angeles

### The Little Water Gold Washer

For full particulars apply

219 Commercial St., LOS ANGELES, CAL.

### REPRESENT LEADING PROPERTIES

Surveys and examinations made and reports furnished by the most competent experts.  
CORRESPONDENCE SOLICITED  
Information promptly furnished. Address  
J. O. O'Bannon,  
DURANGO, MEXICO

### DENVER PUBLIC --- SAMPLING WORKS,

M. E. SMITH, PROP. &amp; MGR.

ORES SOLD ON THE PUBLIC MARKET. Denver, Colo.

## Attention Mining Men! J. MAIT'S DRY GOLD SAVER

Manufactured and Exhibited at

625 Howard Street, San Francisco, Cal.

PINK Gold Saved as Easily as the COARSE. NO WATER required for Cleaning up. We save 98 per cent. Come and witness a test on dry ground. Capacity of Standard Machines 10 Tons. Weight 125 lbs. Price \$90.00; First-Class Material Used Throughout. Capacity of Small Machine 3 Tons; Weight 80 pounds; Price \$30.00. Machines are easily Taken Apart to be packed or carried anywhere. We build Machines to any size—power or hand. Orders promptly attended to. Call or write for Circulars.

F. GOTTFRIED, General Manager and Manufacturer,  
625 Howard Street, San Francisco, Cal.

G. C. FOWLER,

656-58 HOWARD STREET, SAN FRANCISCO.

W. T. SMITH

JAMES IRVING

SMITH & IRVING,  
FORMERLY, W. T. SMITH & CO.

## Gold Refiners and Assayers.

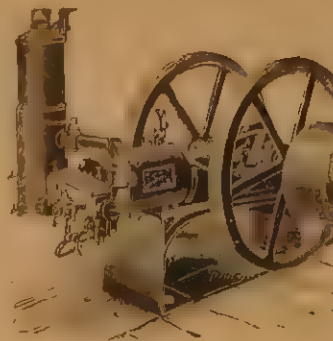
Bulion to any value bought and Cash paid for the same day it is received.  
We guarantee two (2) assays on every sample left with us.

Our Mr. Smith owned and operated Smelting, Refining and Chemical works in Providence R. I., for over 20 years.

128 N. Main Street Los Angeles, Cal.

MINING AND METALLURGICAL JOURNAL

## Cheap Power!



Save Money by Using

### "DANIEL BEST" Crude Oil Engine

This Engine can be operated on either Crude Oil, Distillate, Gasoline, or Kerosene. IT IS THE CHEAPEST POWER ON EARTH and is not tied to any one kind of oil, but can use any kind that will make gas and is not handicapped by being compelled to use a certain oil. Do not forget this when in need of an Engine.

We guarantee our Engines to work perfectly on California Crude Oil, or Distillate, or any other kind of gaseous oil: we however prefer CALIFORNIA CRUDE OIL, from Coalinga, Fresno county, for the reason that gas from Crude Oil will produce more power from the number of feet of gas used than from any other oil and it is also a natural lubricant as well, the valves being always lubricated sufficiently to prevent them from sticking, thus assuring greater durability of the working parts than it otherwise would be in using dry gas. And another advantage we claim is, that danger from explosions is reduced to a minimum, there being no accumulation of gas but is used by the Engine as fast as it is generated and hence is absolutely safe. The following is a test that we made with one of our Five-Horse Power Crude Oil Engines running ten hours on the different gas oils:  
Cal. Crude Oil, 40 grav., 7 1/4 gal. at 6c. \$ .37 1/2  
Distillate, 40 " 7 1/2 " 8c. .40  
Dom. Coal Oil, 40 " 7 1/2 " 12 1/2c. .39 1/2  
Gasoline, 74 " 8 1/2 " 15c. 1.31 1/2  
City Gas.....1,000 feet, 2.00

We manufacture all sizes from two-horse power up, and will guarantee that our Engines will run cheaper and are more simple in construction, have fewer parts and hence are more durable than any other Gas Engines on the market. Seeing is believing don't take our word for it, but come and investigate for yourselves. You can always see one in operation at our works. We will be pleased to see you and will at all times take pleasure in showing them up. Our Engines are specially adapted for running well and mining machinery—in fact, for any kind of power desired, we are the pioneers and first inventors of Crude Oil and Distillate Engines. WE ALWAYS LEAD AND NEVER FOLLOW. Send for Catalogue and Price List of the only genuine Crude Oil and Distillate Engine made.

The Best Manufacturing Co.  
San Leandro, Cal.

### METAL MARKET.

New York Quotations:

	SILVER.	COPPER.	LEAD.
May 17	99 1/2	11 00	3 12 1/2
" 18	61	11 00	3 12 1/2
" 19	60 1/2	11 12 1/2	3 12 1/2
" 20	60 1/2	11 12 1/2	3 12 1/2
" 21	60	10 12 1/2	3 00
" 22	60 1/2	10 12 1/2	3 10
" 23	60 1/2	10 12 1/2	3 12 1/2
" 24	60 1/2	11 00	3 12 1/2
" 25	60 1/2	11 00	3 12 1/2
" 26	60	11 00	3 12 1/2
" 27	60	11 00	3 12 1/2
" 28	60	11 00	3 12 1/2
" 29	60 1/2	11 00	3 12 1/2
" 30	60 1/2	11 00	3 12 1/2

### MINING STOCK QUOTATIONS

BOSTON

A. Jones	80	Franklin	11 00
Atlantic	28 00	Kearse	18 00
Boston & Mont	124 00	Oscar	35 00
Battle & Boston	18 00	Quincy	112 00
Cal. & Helon	270 00	Tamarack	125 00
Centennial	9 00	Wolverine	10 50

### COLORADO SPRINGS STOCKS

A. Jones	80	Franklin	11 00
Atlantic	28 00	Kearse	18 00
Boston & Mont	124 00	Oscar	35 00
Battle & Boston	18 00	Quincy	112 00
Cal. & Helon	270 00	Tamarack	125 00
Centennial	9 00	Wolverine	10 50

### DENVER STOCK REPORT

Aetna	81	Elkton	1 40
Alamo	80 1/2	Garfield	07 1/2
Anaconda	80	Golden Fleece	26
Arcadia	604	Gold Standard	00 1/2
Consolidated	06	Insley	00 1/2
Bangkok-C-Bell	27 1/2	Iron Clad	47
Bankers	00 1/2	Isabella	07
Ben Hur	00	Jack Pot	07
Bob Lee	82	Jefferson	11 1/2
Boston & C. Co.	01 1/2	Mellie Gibson	35
Chimbarazo	31 1/2	New Zealand	05 1/2
C. K. & N.	00 1/2	People's	03 1/2
Colo. C. & M.	01	Pharmacist	12 1/2
C. C. Con	11		

### HELENA, MONTANA

Am Den & M Co	85	Granite Mount	1 25
Bald Butte	2 25	Hope	1 50
Benton Group	18	Iron Mountain	40
Bi-Metallic	1 75	Moulton	30
Combination	35	Potosi	06

### NEW YORK

Crown Point	16	Sierra Nevada	25
Con. Cal. & Va.	130	Standard	1 75
Gould & Curry	30	Union Con	30
Hale & Norcross	80	Iron Silver	48
Homesick	80 50	Quicksilver	3 00
Mexican	30	Quicksilver pfd	17 00
Ontario	10 50	Bulwer	25
Ophir	71	Yellow Jacket	25
Plymouth	70	Deadwood	46

### SAN FRANCISCO.

Alta	65	Monro	15
Belcher	65	Nevada Queen	50
Best & Belcher	72	Ophir	71
Bodie Con	55	Potosi	08
Chollar	85	Savage	38
Con. Cal. & Va.	130	Sierra Nevada	25
Crown Point	16	Union Con	30
Hale & Norcross	80	Uta	87
Mexican	30	Yellow Jacket	25
Gould & Curry	30	Bulwer	25

### ST. LOUIS.

American Nettle	35	Elizabeth	38
Granite Mt.	130	Leo	3
Adams	60	Hope	1 48
Bi-Metallic	1 75	Small Hopes	80

### SALT LAKE CITY

Ajax	70	Horn Silver	2 22
Alliance	38	Little Pittsburg	53
Am. Nat. G's	00 1/2	Lucky Bill	20
Anchor	1 20	Mammoth	2 05
Bogart	07 1/2	Mercur	7 05
Bull, Beck	8 00	Ontario	10 50
Cent. Eureka	82 50	Rover	87 1/2
Dalton	28	Silver King	18 50
Daly	5 50	Bloux Con	85
Daly West	8 00	Swansea	2 40
Four Aces	12	So Swansea	1 80
Gibson	18	Tito Con	30
Geyser	1 45	Uta	87

### MEXICO

Name of Company	State	Price
Angustias	Guajalato	\$ 520
Antirio y Anexas	Zacatecas	210
Cerro Colorado	Chihuahua	10
Concepcion y Anexas	S. Luis Potosi	100
El Oro	Guajalato	80
do. pro.		80
Los de Borda	Michoacan	30
do. Free stock		38
Luz de Maravillas	Hidalgo	100
Real del Monte		1,100
Rosario y Anexas	Durango	80
do. pro.		80
San Rafael del Oro	Guajalato	98
Sta. Gertr. y Anexas	Hidalgo	187
do. Free Stock		201
Sta. Maria de la Paz	S. Luis Potosi	400
Fluorugo	Puebla	40
Zonitavacan (gold)	Veracruz	100
Zona Min. de Potosi	Guajalato	40

Note—The above Mexican stocks are figured on the basis of Mexican silver.



## NEW IMPROVED McGlew Ore Concentrator

IN USE IN

California  
Oregon  
Washington  
Nevada  
Arizona Territory  
Mexico  
Central America  
Australia



Patented  
Sept.  
1893

We guarantee these machines to handle an average of ten tons per 24 hours, and to do cleaner and closer work than any other CONCENTRATOR in use.

**Price, \$300 Net Cash, f. o. b.**

Write for Descriptive and Testimonial Circulars

**THE MCGLEW ORE CONCENTRATOR CO.,** 131 First Street, San Francisco, Cal.

## FAIRBANKS Ore and Bullion Scales



Ore Cars, Steam Pumps, Fairbanks  
Gas Engine.

SCALES OF ALL SIZES AND CAPACITIES  
We make a Specialty of

Scales for Mines, Mills and Smelters.

**Fairbanks, Morse & Co.**

316 Market St., San Francisco, Cal.  
210 North Los Angeles Street, Los Angeles, Cal.  
Correspondence Solicited.

## WASHBURN & MOEN MFG. CO.



**WIRE ROPE AND WIRE**  
OF EVERY DESCRIPTION

PACIFIC WORKS

SAN FRANCISCO



**Zenith Gas & Gasoline Engine**

The Most Perfect Made,  
SIMPLE, NOISELESS, ECONOMI-  
CAL, SMOOTH RUNNING,  
AND EASY STARTING

**WM. A. FRUHLING, Agt.**

210 and 210 S. Los Angeles St., Los Angeles, Cal.

## C. A. LUCKHARDT & CO.

Nevada Metallurgical Works.

71 AND 73 STEVENSON STREET, SAN FRANCISCO, CAL.

**Assaying, Analyses, Sampling.**

Despatched Working Tests of Ore by Mail Processes

**STAMP MILL AND CONCENTRATOR IN  
OPERATION ON PREMISES**

**N. OHLANDT & CO.**

MANUFACTURERS OF

**Best Quality of BONE ASH for Assayers.**

Our Goods are used in all parts of the United States and Mexico

EXTRA No. 1 and No. 2

CORRESPONDENCE SOLICITED

327 MARKET STREET, SAN FRANCISCO, CAL.

## MINING PIPE



**STEEL OR IRON.**—We make pipe of either, but recommend STEEL, it being superior to iron in many particulars and inferior to none.

WRITE FOR CIRCULARS OF THE TRUAX PATENT AUTOMATIC ORE CARS.

**SCHAW, INGRAM, BATCHER & CO.,** Hardware Merchants  
SACRAMENTO, CALIFORNIA.

## The Harrington & King Perforating Co.

METALS PERFORATED AS REQUIRED  
FOR MINING SCREENS OF ALL KINDS FOR USE IN

Mining and Milling Machinery, Re-  
duction and Concentrating Works  
Standard Sizes Perforated Tin and Brass Always in Stock

MAIN OFFICE AND WORKS, 214-243 NORTH UNION ST., CHICAGO, ILL.

## Dry Gold Washers

ADAPTED TO PLACER MINING

MANUFACTURED BY

**F. F. COLLINS,**

MANUFACTURING CO.  
SAN ANTONIO, TEXAS

Send for Catalogue of General Pumping  
and Water Supplies.



# The Mining and Metallurgical Journal

Is the *ONLY* publication in the *SOUTHWEST* devoted to the Mining Industry and circulates in every *MINING CAMP* or place where there is a *MINE, MILL* or *SMELTEE* in California, Mexico, Lower California, Arizona, New Mexico, Texas, Nevada, Utah and Colorado. It has a *LARGER* circulation in Southern California, Mexico, Lower California, Arizona, New Mexico and Texas than any other *MINING JOURNAL* published and is therefore the best advertising medium for those seeking business with the Mines Mills and Smelters.

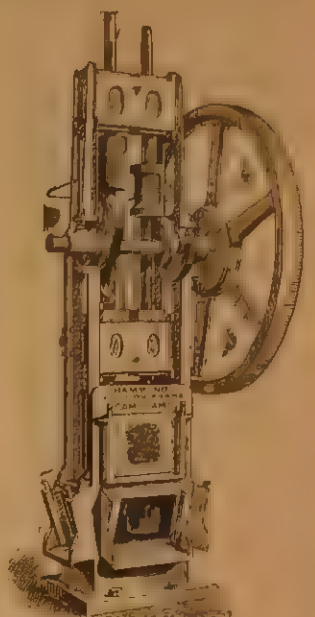
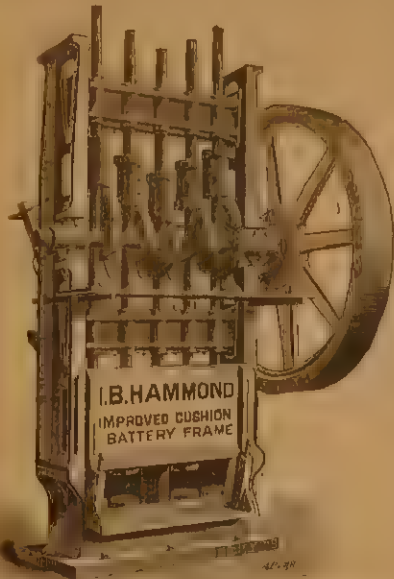




# HAMMOND MANUFACTURING CO.

MANUFACTURER OF

## STAMP MILLS CONCENTRATORS And all Classes of MINING MACHINERY



Wire Rope Tramways with Automatic Loading Apparatus permitting the ore bins to be permanently open.

Specialty made of the Improved, Iron Frame Self-Contained Stamp Mill, the greatest success of the day in reduction of ore to pulp. A great boon to mill builders in countries where timber is plenty and therefore a greater boon to those who have no timber from which to draw the huge pieces needed in old style mills. We claim for this mill:

- 1st. It is no longer a new thing, but well tried and its durability proven
- 2d. Cheaper than the Wooden Frame Mill when ready to run.
- 3d. Saves a great amount of delay in erection and it can be set up in as short a time as a self contained engine.
- 4th. Saves much space

We call the attention of Prospectors to our Self Contained Two Stamp Mill.

We have inaugurated a system of amalgamation and Concentration which renders both much more satisfactory and cheapens the cost of concentration by a great saving in the repairs to the complicated machinery now used.

Parties intending erecting mining plants would do well to investigate our mills. We build any mill desired and will deliver F. O. B. Steamer or cars at San Francisco, California.

We are prepared to furnish parties desiring small plants in localities where fuel is extremely expensive, with mills coupled up and ready to run with gas.

Write us for Catalogues and Estimates

## HAMMOND MANUFACTURING COMPANY

89 First Street,  
PORTLAND, OR.

### THE JOHANNESBURG SAMPLING WORKS

Purchasers of Gold, Silver, Copper and Lead Ores and Concentrates

Cash Returns Made Within Twenty four hours after receipt of Ore

CHAS. R. MORGES, MANAGER,

Johannesburg, Cal.

### SHEPARD, WHEELER & RHODES

Mining Engineers and U. S. Deputy  
Mineral Surveyors.

Have a Complete and Accurate Map made from  
Actual Surveys, showing all Mining Claims  
in the Randsburg Mining District.

Price, \$10.00 Randsburg, Cal.

### RANDBURG A. J. PETTER, MINING ENGINEER AND ASSAYER

Examiner and Dealer in Mines. Have  
Several properties listed for sale. Cor-  
respondence solicited with intending purchasers.

### H. L. NELSON & CO. Real Estate and Mining Broker

Abstract Bureau & Notary Public  
Correspondence Solicited.

RANDBURG AND JOHANNESBURG, CALIF.

### Nolan & Smith Mining Brokers

Capital furnished for Purchase of Mines  
and Prospects.  
A so for Development of those that have merit.  
Send description and Samples  
228 W. Second St., LOS ANGELES, CAL.

It Pays to Advertise in the Journal.

## Los Angeles Business College

212 WEST THIRD ST., LOS ANGELES, CAL.

Gives a thorough course in PRACTICAL ASSAYING and CHEMICAL ANALYSIS in connec-  
tion with their other courses of study. For full information address them as given above.

School of Practical, Civil, Mechanical,  
Electrical and Mining Engineering.  
Surveying, Architecture, Drawing and Assaying.  
933 MARKET ST. SAN FRANCISCO, CAL.  
OPEN ALL YEAR

PROF. VAN DER NAILLEN, Jr. President  
Assaying of Ores, \$25. Bullion and Chlorination  
Assay, \$25; Blow-off Assay \$10. Full Course  
of Assaying, \$50. Established 1864

Send for Circular

## BELTING Of all Descriptions,

FOR MILLS MINES AND SMELTERS

Specialties—

DYNAMOMETER, WATER PROOF,  
RAWMIRE AND SAWN  
BELTING.

Fred R. Cook,

208 Mission Street, San Francisco, Cal

JOHN P. CULVER, Civil Engineer.

FRANK H. JACKSON, Mining Engineer

JOHN P. CULVER & COMPANY,

ASSAYERS, MINERALOGISTS and MINING ENGINEERS,

145 South Broadway, LOS ANGELES, CAL.

E. E. BURLINGAME'S

### ASSAY OFFICE

Established in Colorado, 1886. Samples  
by mail or express will receive prompt  
and careful attention. Gold and Silver  
Bullion refined, melted and assayed, or  
purchased.

Address 1736 and 1738 Lawrence St., Denver, Col.

### Union Iron Works

Manufacturers of and Dealers in

Mining,  
Milling,  
AND  
Smelting

### MACHINERY

Foundry and Machine Shops.

ALBERT THOMAS, Prop.

First and Alameda Sts. Los Angeles, Cal

### Miners' Assay Office

LOUIS SECKELS, MANAGER  
24 W. 2d, South St., Salt Lake City, Utah  
P. O. Box, 1315.

Assay for Gold and Silver 75 Cents.  
Samples sent by mail or express will receive  
Prompt and Careful Attention.

## GOLD IN COLORADO!

Colorado has within its limits some of the greatest gold mines that have ever been discovered. In Cripple Creek in 1892 there were a few prospector's looking over the hills; in 1896 the camp turned out over \$10,000,000 in gold. The West Creek district which is only thirty miles north of Cripple Creek is being thoroughly prospected and is one of the most inviting fields at the present time for the mines. The Denver and Rio Grande railroad has built a substantial stage road from Palmer to Temberion which will greatly shorten the distance between Denver and the West Creek district. Leadville, the old bonanza camp and the mineral product of which made Denver what it is today, is becoming a big producer of gold. The low price of silver has driven all the men and capital who were formerly in silver mining to gold mining and the new inventions for working low grade gold ores together with the discoveries made to work rebellious ores has opened up a field for the miners such as they have never enjoyed before and Colorado has inducements to offer such as no other district in the world possesses, the record of the state in gold production for the last three years speaks for itself. Among the other prominent camps in the state are Telluride, Ophir, Rico, Silverton, Mineral Point, Durango, La Plata, Ouray, Saw Pit, Ironton, the Gunnison District and many others. New finds are being made and new camps are springing into existence every day. The Denver & Rio Grande railroad, which is the pioneer road of Colorado and which has always been the miner's friend, reaches all the mining camps in Colorado. For elegantly illustrated descriptive books, free, of mines in Colorado, send to  
W. J. SHOTTS, General Agent  
314 California St., San Francisco, Cal.

S. K. HOOPER,  
General Passenger Agent,  
DENVER, COLO.

J. K. EVELETH

V. H. M. MACLYMONT

### EVELETH & MACLYMONT,

ASSAYERS

Assays and Analyses of Ores, Practical Mill-tests by 2-stamp Mill and Concentrating Plant,

10 Annie Street, San Francisco (Opposite Palace Hotel)

Cable Address: Villemont, San Francisco

Telephone: Main 738



**W. W. MONTAGUE & CO.**

MANUFACTURERS OF

Riveted Sheet Iron and Steel

**WATER PIPE**

For Hydraulic Mining Power Plants and Mills.

Iron Cut, Punched and Formed for Making Pipe on the Ground Where Required to Save Freight.

**GALVANIZED IRON**

Air Pipe, Concentrator Rolls, Water Tanks

SAN FRANCISCO, CAL.

**THE BI-METALLIC ASSAY OFFICE**

AND CHEMICAL LABORATORY.

Assaying in all its branches. Determinations accurately made.

R. A. PEREZ, E. M., Mgr.

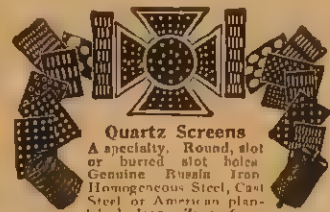
FORMERLY: Chief Assayer El Paso Smelting Works, El Paso, Tex.  
Assistant Chemist Consolidated Kansas City Smelting and Refining Co., Argentine, Kansas.

(Prompt Returns.)

124 S. MAIN ST., LOS ANGELES CAL.

#33,014,000

Paid In Dividends by Utah Mining Stocks

Weekly Market Letter on Application.  
Quotations by Wire or MailJAMES A. POLLOCK, Mining Stock Broker,  
SALT LAKE CITY, UTAH.**KENNETH DONNELLAN**  
Stock & Mining BrokerWeekly Quotations furnished on request  
Reference: Any Bank or Banker  
in Salt Lake City, Utah**Quartz Screens**A specialty. Round, slot  
or buried slot holes.  
Genuine Russian Iron  
Homogeneous Steel, Cast  
Steel or American plan-  
ished Iron, Zinc, Cop-  
per or Brass Screens for all purposes. CALIFORNIA  
PERFORATING SCREEN CO., 111-117 Beale St., S. F.**UNION HARDWARE AND METAL CO.**

— DEALERS IN —

**Boiler Tubes, Iron Pipe and Fittings**

RAILROAD, MILLING, MINING and FOUNDRY SUPPLIES

214 and 216 N. Los Angeles Street

Los Angeles, Cal

**THE WILSON**  
Forged High Grade Steel  
**Shoes and Dies**Guaranteed to Wear Longer and Prove Cheaper than any others.  
Made by use of Special Appliances. Patented Aug. 16th, 1893.  
— Made only by —**WESTERN FORGE AND ROLLING MILLS,**  
St. Louis, Missouri**JOSHUA HENDY MACHINE WORKS**

SOLE AGENTS

38 to 44 Fremont Street,

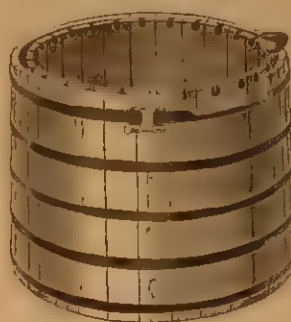
San Francisco, Cal.

**J. H. MASTERS,**

Manufacturer of and Dealer in

**Ore Sacks, Tents and Camp**

Furnishings

218 Commercial St.,  
LOS ANGELES, CAL.**TANKS**

OF EVERY DESCRIPTION

Mines, Mills and Cyanide Plants

**Patent Non-Shrinking Water Tanks**The only Tank that will stand the Desert  
and Hot ClimateWrite for Catalogue and Estimate on any kind  
of Tank Work**Pacific Tank Co.**

33 BEALE ST., SAN FRANCISCO

**To Gold Miners!****Silver Plated Copper AMALGAMATING PLATES**

For Saving Gold In Quartz and Placer Mining.

EVERY DESCRIPTION OF MINING PLATES MADE.

Only Best Copper and Refined Silver Used. Old Min-  
ing Plates Replated. Twenty-six Medals Awarded.  
Gold, Silver, Nickel, Copper & Brass Plating.**Denniston's San Francisco Plating Works**

653 and 655 Mission Street, San Francisco, Cal.

E. G. DENNISTON,

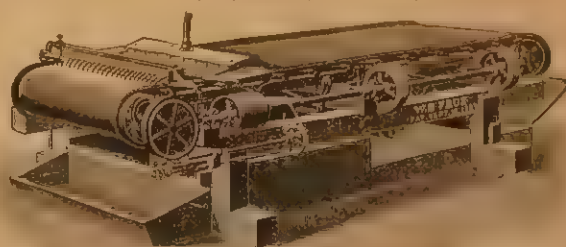
Proprietor

Send for Circular.

**FRUE ORE CONCENTRATOR**

Over 4,200 in Actual Use

Manufactured under Patents of April 27, 1880; Sept. 18, 1883; July 24, 1888; and March 31, 1891



It can be safely stated, without going into a description of several new and untried concentrators that have lately come into the market, that where sulphurets are of such value as to make close sorting necessary, the Frue Vanner is always used. It is the only endless belt concentrator in the market that can be relied on to handle all classes of ores, and give universal satisfaction. (In all competition of concentrators the Frue Vanner is taken as the standard machine of the world, and all comparisons made by it. There have been over 4200 of these machines sold, 1700 having been sold on the Pacific Coast alone.) They are in use in every part of the world where mining is carried on, and in all cases they are giving perfect satisfaction. From time to time valuable and important improvements have been made in this machine to increase its capacity and durability, and particular attention is called to the Patent Lip Flange for the rubber belt, which does away with nearly all the strain and cracking, as in the old style of flange, making the life of belt more than double that of other style belts in the market. The lip of flange bends outward in going over the large end rolls, thereby distributing the strain in the solid rubber, and bringing virtually no strain either at the edge or at the base of flange, as is the case in all belts with a raised edge.

Price of 4-foot wide Plain Belt Frue Vanner. ....	\$500 f. o. b.
" " Improved Belt Frue Vanner. ....	600 f. o. b.
" 6-foot wide Plain Belt. ....	600 f. o. b.

For any information, pamphlets, circulars or testimonials, call on or address

**JAS. S. BROWNELL,** Western Agent **FRUE VANNING MACHINE CO.**  
Successor to ADAMS & CARTER

132 Market Street,

San Francisco

F. M. ENDLICH.

Late Mineralogist Smithsonian Institution

GEO. F. HOYT.

U.S. Deputy Mineral Surveyor

**ENDLICH & HOYT.****Mining Engineers and Metallurgists**Mines and Processes examined and reported on. Specialties:—Treatment of  
Low-grade Ores, Concentration, Cyanide Leaching, Designing, and  
erection of suitable plants for refractory ores. Mines bought  
and sold. Only properties that will stand closest in-  
vestigation considered. Surveying and un-  
pure Assays and Analyses.

Correspondence Solicited.

Office: 201 Bullard Block,

Los Angeles, Cal.



## INCORPORATED MINES PAYING DIVIDENDS.

NAMES OF MINES	LOCATION	No. of Shares	Capital Stock	Per Value	Amount of Last Dividend	Date of Last Dividend	Total Amount Paid in Dividends	Kind of Minerals Produced
Aetna Cons.	California	100,000	\$ 500,000	\$ 5	\$ 10	Dec. 1896	\$ 80,000	Q.
Adams	Colorado	150,000	1,500,000	5	0 04	October 1895	693,500	S, L, C
Alaska, Treadwell	Alaska	200,000	5,000,000	25	10	January, 1897	3,100,000	G.
Alaska Mexican	Alaska	200,000	1,000,000	5	37 1/2	January, 1897	191,000	G.
Anaconda	Montana	100,000	30,000,000	25	1 25	Nov. 1896	2,400,000	C.
Anchorage Island	Colorado	600,000	600,000	1	01	Jan. 1897	36,000	G.
Atlantic	Michigan	40,000	1,000,000	25	1 00	Feb. 1897	7,000	C.
Bald Butte	Montana	250,000	250,000	1	03	June 1896	470,500	S, G.
Bangkok C-Bell	Colorado	600,000	600,000	1	1	July 1896	107,511	S, L, C
Big Six	Colorado	500,000	500,000	1	00 1/2	May 1896	2,300	G, S
Boston & Montana	Montana	150,000	3,750,000	25	3 00	Feb. 1897	5,375,000	G, C, S
Bullion Beck and Champ	Utah	100,000	1,000,000	10	20	Jan. 1897	1,967,000	G, S.
Cariboo	British Col.	800,000	800,000	1	02	Dec. 1896	125,111	G.
C. O. D.	Montana	500,000	500,000	1	01	March 1896	25,000	G.
Calumet & Hecla	Michigan	100,000	2,500,000	25	15 00	Feb. 1897	18,450,000	S, L.
Centennial Eureka	Utah	30,000	1,500,000	50	1 00	Jan. 1897	1,800,000	S, L.
Champion	California	3,400	34,000	10	10	August 1895	2,600	G.
Consolidated, California and Virginia	Nevada	216,000	21,600,000	100	25	March 1895	3,592,800	S, G.
Coplis	Nevada	100,000	10,000,000	100	01	Feb. 1895	77,100	G.
Copper Queen Consolidated	Arizona	200,100	2,000,000	10	25	June 1895	1,910,000	C.
Daly	Utah	150,000	3,000,000	20	25	August 1896	2,887,500	S, L.
Deadwood Terra	Dakota	200,000	5,000,000	25	50	August 1896	1,240,000	G.
De Lamar	Idaho	400,000	2,000,000	5	25	October 1896	2,250,100	S, L
Dorbec B Gravel	California	100,000	10,000,000	100	05	March 1894	265,000	G.
Dalton and Lark	Utah	2,500,000	2,500,000	1	00 1/2	August 1896	87,500	S, L.
Elkhorn	Montana	200,000	1,000,000	5	06	June 1895	1,212,000	S.
Elkton	Colorado	500,000	500,000	1	02	Jan. 1897	191,960	G, S.
Enterprise	Colorado	500,000	2,500,000	5	25	June 1893	825,000	S.
Flourance	Montana	500,000	2,500,000	5	01	Jan. 1897	118,096	S.
Franklin	Michigan	40,000	1,000,000	25	2 00	January 1894	1,240,000	C.
Galena	Utah	100,000	1,000,000	10	05	Jan. 1897	71,000	G, S, L
Garfield Grouse	Colorado	1,200,000	1,200,000	1	01	Dec. 1896	24,000	G.
Golden Eagle	Colorado	1,000,000	1,000,000	1	01	Sep. 1896	10,000	G.
Golden Piece	Colorado	600,000	600,000	1	01	Dec. 1896	563,179	G, S.
Gold Coin	Colorado	200,000	1,250,000	5	10	Feb. 1897	120,000	G, S.
Gold and Globe	Colorado	750,000	750,000	1	3-10	August 1896	38,000	G.
Granite Mountain	Montana	400,000	10,000,000	25	20	July 1892	12,120,000	S.
Great Western	California	50,000	5,000,000	100	10	November 1893	388,368	Q.
Hecla Consolidated	Montana	30,000	1,500,000	50	50	January 1897	2,160,000	Q, G, L, C
Helena & Frisco	Idaho	500,000	2,500,000	5	04	August 1896	475,000	S, L.
Homestake	Dakota	125,000	12,500,000	100	25	Jan. 1897	6,118,750	G.
Hop	Montana	100,000	1,000,000	10	10	February 1897	662,252	S.
Horn Silver	Utah	400,000	10,000,000	25	12 1/2	January 1896	5,137,500	S, L.
Iowa	Colorado	1,000,000	310,000	1	01	Dec. 1896	60,000	G.
Iron Mountain	Montana	500,000	5,000,000	10	06	Nov. 1896	492,500	S.
Isabella	Colorado	2,250,000	5,000,000	100	01	Sep. 1896	202,500	G.
Kearsarge	Michigan	40,000	1,000,000	25	00	Dec. 1895	120,000	C.
Kennedy	California	100,000	10,000,000	1	48	August 1895	1,796,000	G.
Leadville Consolidated	Colorado	400,000	4,000,000	10	03	February 1893	316,000	S, L.
Mail of Erin	Colorado	600,000	3,000,000	5	02	November 1895	740,000	S, L, G, C
Mayflower	California	60,000	1,200,000	20	10	December 1895	242,000	G.
Minnesota	Minnesota	165,000	16,500,000	100	1 50	July 1896	3,240,000	I.
Mollie Gibson	Colorado	1,000,000	5,000,000	5	05	January 1895	4,080,000	S.
Montana Lt	Montana	660,000	3,300,000	5	06 1/2	October 1895	2,890,637	G, S.
Moore	Colorado	600,000	600,000	1	01	January 1896	186,000	G.
Mountain Star	California	2,400	240,000	100	7 00	October 1895	446,400	G.
Moulton	Montana	400,000	2,000,000	5	05	February 1894	460,000	G, G.
Mercur	Utah	200,000	5,000,000	25	12 1/2	Jan. 1897	600,000	G.
Mammoth	Utah	400,000	10,000,000	25	05	Nov. 1896	1,150,000	G, S, C
Moon Anchor Gold	Colorado	600,000	600,000	1	01	July 1896	24,000	G.
New Elkhorn	Colorado	300,000	1,500,000	5	24	Sep. 1896	72,000	G.
New York & Hon. Rosario	Central A.	150,000	1,500,000	10	10	Jan. 1897	690,000	S, G
Mt. Rosa	Colorado	1,000,000	1,000,000	1	00 1/2	Oct. 1896	30,000	G.
Napa	California	100,000	700,000	7	10	January 1897	820,000	Q.
North Star	California	100,000	1,000,000	10	50	June 1893	450,000	G.
Nugget	Colorado	1,000,000	1,000,000	1	00 1/2	Jan. 1895	10,000	G.
Omaha Consolidated	California	24,000	2,100,000	100	15	July 1894	97,200	G.
Ontario	Utah	150,000	15,000,000	100	10	January 1897	13,450,000	S, L.
Oseola	Michigan	50,000	1,250,000	25	1 00	February 1897	2,122,500	C.
Pacific Coast Borax	California	20,000	2,000,000	100	1 00	July 1895	422,500	B.
Parrot	Montana	230,000	2,300,000	10	10	June 1894	1,622,000	C.
Plumas Eureka	California	146,600	1,466,000	10	18	October 1893	2,696,200	G.
Portland	Colorado	3,000,000	3,000,000	1	01	January 1897	861,000	G, S
Quicksilver Pref.	California	48,000	4,800,000	100	25	June 1891	1,823,911	Q.
Quincy	Michigan	50,000	1,250,000	25	00	February 1897	9,070,000	C.
Red Cloud	Idaho	200,000	1,000,000	5	10	December 1892	153,000	S, L.
Rico Aspen	Colorado	1,000,000	5,000,000	5	02	November 1894	320,000	S.
Sierra Botles	California	222,500	2,225,000	10	12	October 1893	1,579,943	G.
Silver, Mg	New Mexico	500,000	500,000	1	4 05	December 1891	300,000	S.
Small Hopes Consolidated	Colorado	250,000	5,000,000	20	10	March 1896	3,275,000	S.
Standard	California	100,000	10,000,000	100	10	June 1895	3,771,159	G, S.
St. Joseph	Missouri	250,000	2,500,000	10	25	Dec. 1895	2,624,000	L.
Silver King	Utah	150,000	3,000,000	20	25	Jan. 1897	60,000	S, L, G
Smuggler Union	Colorado	50,000	5,000,000	100	1 00	October 1896	150,000	G, S.
Tom Boy	Colorado	200,000	200,000	10	20	March 1896	410,000	G.
Tamarack	Michigan	50,000	1,250,000	25	3 00	Dec. 1896	4,770,000	C.
Trinity Silver	Colorado	500,000	500,000	1	01	April 1894	37,500	G.
Union	Colorado	1,250,000	1,250,000	1	01	June 1896	74,000	C.
United Verde	Arizona	300,000	3,000,000	10	25	December 1893	562,500	S.
Utah	Utah	100,000	1,000,000	10	02	Nov. 1896	175,000	G, S.
Victor	Colorado	200,000	1,000,000	5	10	Dec. 1896	705,000	G.
War Eagle	B. C.	500,000	500,000	1	05	October 1896	187,000	G.
Yankee Girl	Colorado	260,000	1,300,000	5	25	July 1891	520,000	S.

S, Silver, G, Gold, L, Lead, C, Copper, Q, Quicksilver, I, Iron, B, Borax.

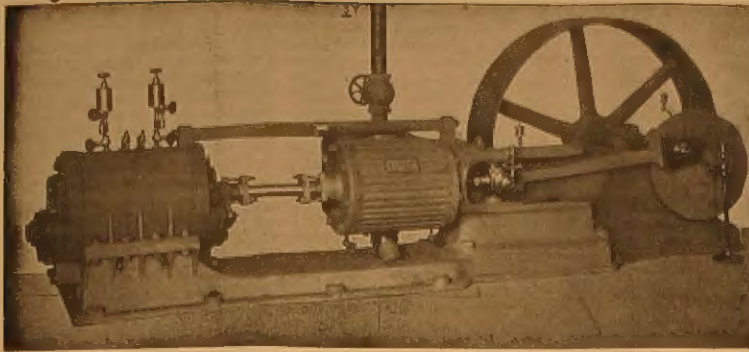












AIR COMPRESSOR

# FULTON ENGINEERING — AND — SHIPBUILDING WORKS

## MINING AND MILLING MACHINERY

Adapted to every description of Mining and Milling.

Office and Branch Works, 213 First street, San Francisco, Cal

## C. DUCOMMUN,

300-302 N. MAIN STREET, LOS ANGELES

### Assayers Materials, Mine AND Mill Supplies

Dixon's Black Lead Crucibles, Denver Fire Clay Crucibles,  
Muffles, Scorifiers, etc.; Quicksilver, Drill Steel,  
Retorts, Mortars, Gold Pans, Drilling Ham-  
mers, Drifting Picks, Horn Spoons  
and Shovels.

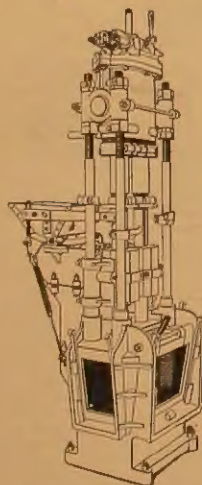
## The Machinery and Electrical Company,

— Sole Agents —  
Southern California, Arizona and Northern Mexico.

For  
**TREMAIN STEAM STAMP MILLS,**  
Oil City Boilers and Engines,  
Rumsey Power Pumps,  
**LAWRENCE CENTRIFUGAL PUMPS,**  
Egan Wood-Working Machinery,  
Bates Corliss Engines, Bliss Turned Steel Shafting,  
**SNOW STEAM PUMPS,**  
Olin Gas Engines, Bradford Mill Co. Lathes  
**GATES IRON WORKS MINING MACHINERY**  
Jewel Leather Belting,  
Globe Rubber Belting,  
Garlock Packing.  
Westinghouse Electric and Manufacturing Company's  
Lighting, Railway and Transmission Apparatus  
Sawyer-Man Incandescent Lamps,  
Washburn & Moen Mfg. Co's Wires and Cables.

Also Dealers and Jobbers in  
Shafting, Hangers, Boxes, Dodge Wood Pulleys, General  
Mining Machinery, Mining Hoists, Whlms, Ore Buck-  
ets, etc. All kinds of Electrical & Engineering Supplies

351 &amp; 353 N. Main St. Los Angeles, Cal.



TREMAIN STEAM STAMP

## HALLIDIE PATENT ROPEWAY

— FOR THE —

Transportation of Ore, Fuel and other  
material, has been erected by us all over  
the country and is the most economical  
and efficient method known. Nothing  
to get out of order; has always given  
satisfaction.

## California Wire Works

[LICENSEES]

Office, 8 Pine Street, San Francisco, Cal.



Mention the Journal.

## We Manufacture

### STAMP MILLS, CRUSHERS, CONCENTRATORS, ENGINES, PUMPS, HOISTS,

Stockton Gas Engine, Water Wheels, Wood, Iron, and  
Clutch Pulleys, and general repairing of all kinds  
of Wood and Iron. All work done in our  
own Shop. Estimates furnished  
for Plants Complete.

Best equipped works in California, outside of  
San Francisco.

CORRESPONDENCE SOLICITED



## Matteson Manufacturing Co.

STOCKTON, CALIFORNIA.

## Los Angeles Tent and Awning Company

Manufacturers of

### Tents, Wagon Covers, Ore Sacks, and Camp Furniture

A. W. SWANFELDT, Proprietor.

250 SOUTH MAIN STREET, LOS ANGELES, CAL.

## WIRE TRAMWAYS

Ropeways,  
\* Incline Planes,  
and Railways.

Hoisting Apparatus, Patent Grip Pul-  
leys, Transmission of Power by Wire  
Ropes; 25 years experience; Send for  
Ropeway Pamphlet.

## California Wire Works

WORKS:

332 Bay Street, San Francisco, Cal.



## ORE TARIFF.

From Points in Mexico, New Mexico, Texas and Arizona, to El Paso, Pueblo, Denver and Kansas City.

## ATCHISON, TOPEKA &amp; SANTA FE R. R.

		Car Loads, in dollars and cents per ton of 2,000 lbs.				
FROM	TO	Ore Concentrates			Lead Bullion, valuation not to exceed \$100 per ton.	Base Metal, Copper Matte, Bar and Black Copper, valuation not to exceed \$500 per ton.
		Valuation not to exceed \$50 per ton.	Valuation not to exceed \$100 per ton.	Valuation not to exceed \$300 per ton.		
SONORA RAILWAY						
Guaymas, Mex.	El Paso	10.00	11.50	13.50		
	Pueblo	12.50	14.00	16.00		
	Denver	13.50	15.00	17.00		
	Kansas City	15.50	17.00	19.00		
Ortiz, " "	El Paso	8.50	11.00	13.00		
	Pueblo	12.00	13.50	15.50		
	Denver	13.00	14.50	16.50		
	Kansas City	14.50	16.00	18.00		
Torres, " "	El Paso	8.50	10.50	12.50		
	Pueblo	11.50	13.00	15.00		
	Denver	12.50	14.00	16.50		
	Kansas City	13.50	15.00	17.00		
Hermosillo, " "	El Paso	8.50	10.00	12.00		
	Pueblo	10.00	12.50	14.50		
	Denver	12.00	13.50	15.50		
	Kansas City	12.00	13.50	15.50		
Pesqueira, " "	El Paso	8.00	9.50	11.50		
	Pueblo	10.50	12.00	14.00		
	Denver	11.50	13.00	15.00		
	Kansas City	12.00	13.50	15.50		
Querobabi, " "	El Paso	7.50	9.00	11.00		
	Pueblo	10.00	11.50	13.50		
	Denver	11.00	12.50	14.50		
	Kansas City	11.50	13.00	15.00		
Santa Ana, " "	El Paso	7.00	8.50	10.50		
	Pueblo	9.50	11.00	13.00		
	Denver	10.50	12.00	14.00		
	Kansas City	11.50	13.00	15.00		
Magdalena, " "	El Paso	7.00	8.50	10.50		
	Pueblo	9.50	11.00	13.00		
	Denver	10.50	12.00	14.00		
	Kansas City	11.50	13.00	15.00		
Imuris, " "	El Paso	7.00	8.50	10.50		
	Pueblo	9.50	11.00	13.00		
	Denver	10.50	12.00	14.00		
	Kansas City	11.50	13.00	15.00		
Nogales, A. T.	El Paso	8.50	8.00	10.00		
	Pueblo	9.00	10.50	12.50	15.20	16.80
	Denver	10.00	11.50	13.50	16.20	17.80
	Kansas City	11.00	12.50	14.50	18.40	21.45
Calabazas, " "	El Paso	8.00	7.50	9.50		
	Pueblo	8.50	10.00	12.00	15.20	16.80
	Denver	9.50	11.00	13.00	16.20	17.80
	Kansas City	10.50	12.00	14.00	18.25	21.30
Sanford, " "	El Paso	5.50	7.00	9.00		
	Pueblo	8.00	9.50	11.50	15.00	16.20
	Denver	9.00	10.50	12.50	16.00	17.20
	Kansas City	10.00	11.50	13.50	18.15	21.20
Crittenden, " "	El Paso	5.50	7.00	9.00		
	Pueblo	8.00	9.50	11.50	14.80	16.00
	Denver	9.00	10.50	12.50	15.80	17.00
	Kansas City	10.00	11.50	13.50	17.80	20.85
Fairbank, " "	El Paso	4.40	4.80	6.50		
	Pueblo	6.00	8.50	11.50	14.00	15.20
	Denver	7.00	9.50	12.50	15.00	16.20
	Kansas City	8.00	10.50	13.50	17.00	20.40
Tucson, " "	El Paso	4.35	4.35	5.80		
	Pueblo	9.00	10.50	12.50	14.80	16.00
	Denver	10.00	12.00	14.00	16.80	17.80
	Kansas City	11.50	12.50	14.50	17.80	20.85
Benson, " "	Pueblo	8.00	9.50	11.50	12.80	15.00
	Denver	9.50	11.00	13.00	13.80	16.00
	Kansas City	10.50	11.50	13.50	15.25	17.20
Steins Pass, N.M.	Pueblo	8.00	9.50	11.50	12.20	13.20
	Denver	9.50	11.00	13.00	14.20	15.20
	Kansas City	10.00	11.50	13.50	16.05	18.20
Lordsburg, " "	Pueblo	7.50	9.00	11.00	11.80	12.80
	Denver	9.00	10.50	12.50	13.80	14.80
	Kansas City	9.50	11.00	13.00	15.75	16.80
Silver City, " "	El Paso	2.40	3.20	4.70	8.00	9.00
	Pueblo	4.50	6.00	8.50	11.20	12.20
	Denver	5.50	7.00	9.50	12.20	13.20
	Kansas City	6.50	8.00	10.50	14.40	16.80
Hudson, " "	El Paso	2.40	3.00	4.50	5.80	6.80
	Pueblo	4.50	6.00	8.50	11.20	12.20
	Denver	5.50	7.00	9.50	12.20	13.20
	Kansas City	6.50	8.00	10.50	14.40	16.80
Deming, " "	El Paso	2.20	2.80	3.80	5.20	6.20
	Pueblo	4.00	5.50	7.50	10.80	12.80
	Denver	5.00	6.50	8.50	11.80	13.80
	Kansas City	6.00	7.50	9.50	13.80	15.80
Florida and Lake Valley, " "	El Paso	2.20	2.80	3.80	5.00	6.00
	Pueblo	4.00	5.50	7.50	10.80	11.80
	Denver	5.00	6.50	8.50	11.80	12.80
	Kansas City	6.00	7.50	9.50	13.80	14.80
Nutt, " "	El Paso	2.20	2.40	3.40	4.80	4.80
	Pueblo	4.00	5.00	7.00	10.80	11.80
	Denver	5.00	6.00	8.00	11.80	12.80
	Kansas City	6.00	7.00	9.00	13.80	14.80
El Paso, " "	Pueblo	4.00	5.50	7.50	11.80	12.00
	Denver	5.00	6.50	8.50	12.80	13.00
	Kansas City	6.00	7.50	9.50	14.80	15.00
A. T. & S. F. R. R.	El Paso	1.50	2.00	3.00	4.00	4.70
	Pueblo	3.00	4.50	6.50	11.80	11.80
	Denver	4.00	5.50	7.50	12.80	12.80
	Kansas City	5.00	6.50	8.50	14.80	14.80
Las Cruces, " "	El Paso	2.00	2.50	3.00	4.00	4.00
	Pueblo	4.00	5.00	7.00	11.80	11.80
	Denver	5.00	6.00	8.00	12.80	12.80
	Kansas City	6.00	7.00	9.00	14.80	14.80
Rincon, " "	El Paso	2.00	2.50	3.00	4.00	4.00
	Pueblo	4.00	5.00	7.00	11.80	11.80
	Denver	5.00	6.00	8.00	12.80	12.80
	Kansas City	6.00	7.00	9.00	14.80	14.80

FROM TO

## A. T. &amp; S. F. R. R.

## ATLANTIC &amp; PACIFIC RAILROAD

## Rates on Copper or Zinc Ore to Canon City.

Taking Effect July 1st, 1891.—So far as rates on Copper or Zinc Ores are concerned, Canon City, Col., will be considered as common with Pueblo; in other words the rates shown in Tariff as applying on shipments of Ore to Pueblo, will also apply on shipments of Copper or Zinc Ore to Canon City.

In the absence of positive information as to the value of Ore, Ore Concentrates, or Base Metal, Agents will bill at rates sufficiently high to protect the Company. These rates can be corrected when evidence of actual value is produced.

The market price at destination, to be verified by assays made

Car Loads in dollars and cents per ton of 2,000 lbs.

		Ore Concentrates					
FROM	TO	Valuation not to exceed			Lead Bullion, valuation not to exceed \$100 per ton.	Base Metal, Copper Matte, Bar and Black Copper, valuation not to exceed \$500 per ton.	
		\$50 per ton.	\$100 per ton.	\$500 per ton.			
Engle, N.M. Crocker, " "	El Paso	2.20	2.80	3.80	5.00	6.00	
	Pueblo	2.50	3.00	4.00	5.20	6.20	
	Denver	3.50	4.00	5.00	6.20	7.20	
	Kansas City	4.50	5.00	6.00	7.20	8.20	
Lava, " "	El Paso	2.20	2.80	3.80	5.00	6.00	
	Pueblo	2.50	3.00	4.00	5.20	6.20	
	Denver	3.50	4.00	5.00	6.20	7.20	
	Kansas City	4.50	5.00	6.00	7.20	8.20	
San Marcial, " "	El Paso	2.40	3.00	4.00	5.00	6.00	
	Pueblo	2.70	3.30	4.30	5.30	6.30	
	Denver	3.70	4.30	5.30	6.30	7.30	
	Kansas City	4.70	5.30	6.30	7.30	8.30	
Carthage, " "	El Paso	2.40	3.00	4.00	5.00	6.00	
	Pueblo	2.70	3.30	4.30	5.30	6.30	
	Denver	3.70	4.30	5.30	6.30	7.30	
	Kansas City	4.70	5.30	6.30	7.30	8.30	
San Antonio, " "	El Paso	2.40	3.00	4.00	5.00	6.00	
	Pueblo	2.70	3.30	4.30	5.30	6.30	
	Denver	3.70	4.30	5.30	6.30	7.30	
	Kansas City	4.70	5.30	6.30	7.30	8.30	
Magdalena, " "	El Paso	2.60	3.20	4.20	5.20	6.20	
	Pueblo	2.90	3.50	4.50	5.50	6.50	
	Denver	3.90	4.50	5.50	6.50	7.50	
	Kansas City	4.90	5.50	6.50	7.50	8.50	
Socorro, " "	El Paso	2.60	3.20	4.20	5.20	6.20	
	Pueblo	2.90	3.50	4.50	5.50	6.50	
	Denver	3.90	4.50	5.50	6.50	7.50	
	Kansas City	4.90	5.50	6.50	7.50	8.50	
Albuquerque, " "	El Paso	3.00	3.60	4.60	5.60	6.60	
	Pueblo	3.30	3.90	4.90	5.90	6.90	
	Denver	4.30	4.90	5.90	6.90	7.90	
	Kansas City	5.30	5.90	6.90	7.90	8.90	
Bernalillo, " "	El Paso	3.20	3.80	4.80	5.80	6.80	
	Pueblo	3.50	4.10	5.10	6.10	7.10	
	Denver	4.50	5.10	6.10	7.10	8.10	
	Kansas City	5.50	6.10	7.10	8.10	9.10	
Wallace, " "	El Paso	3.40	4.00	5.00	6.00	7.00	
	Pueblo	3.70	4.30	5.30	6.30	7.30	
	Denver	4.70	5.30	6.30	7.30	8.30	
	Kansas City	5.70	6.30	7.30	8.30	9.30	
Los Cerillos, " "	El Paso	3.60	4.20	5.20	6.20	7.20	
	Pueblo	3.90	4.50	5.50	6.50	7.50	
	Denver	4.90	5.50	6.50	7.50	8.50	
	Kansas City	5.90	6.50	7.50	8.50	9.50	
Flagstaff, A.T. Seligman, " "	El Paso	6.50	8.00	10.00	14.00	16.00	
	Pueblo	7.50	9.00	11.00	15.00	17.00	
	Denver	8.50	10.00	12.00	16.00	18.00	
	Kansas City	9.50	11.00	13.00	17.00	19.00	
Peach Spgs. Hackberry, " "	El Paso	7.50	9.00	11.00	15.00	17.00	
	Pueblo	8.50	10.00	12.00	16.00	18.00	
	Denver	9.50	11.00	13.00	17.00	19.00	
	Kansas City	10.50	12.00	14.00	18.00	20.00	
Kingman, " "	El Paso	7.50	9.00	11.00	15.00	17.00	
	Pueblo	8.50	10.00	12.00	16.00	18.00	
	Denver	9.50	11.00	13.00	17.00	19.00	
	Kansas City	10.50	12.00	14.00	18.00	20.00	
Yucca, " "	El Paso	7.50	9.00	11.00	15.00	17.00	
	Pueblo	8.50	10.00	12.00	16.00	18.00	
	Denver	9.50	11.00	13.00	17.00	19.00	
	Kansas City	10.50	12.00	14.00	18.00	20.00	
Needles, Cal.	El Paso	7.50	9.00	11.00	15.00	17.00	
	Pueblo	8.50	10.00	12.00	16.00	18.00	
	Denver	9.50	11.00	13.00	17.00	19.00	
	Kansas City	10.50	12.00	14.00	18.00	20.00	
Fenner, " "	El Paso	8.25	9.75	11.75	15.75	17.75	
	Pueblo	9.25	10.75	12.75	16.75	18.75	
	Denver	10.25	11.75	13.75	17.75	19.75	
	Kansas City	11.25	12.75	14.75	18.75	20.75	
Bagdad, " "	El Paso	8.50	10.00	12.00	16.00	18.00	
	Pueblo	9.50	11.00	13.00	17.00	19.00	
	Denver	10.50	12.00	14.00	18.00	20.00	
	Kansas City	11.50	13.00	15.00	19.00	21.00	
Daggett, " "	El Paso	9.00	10.50	12.50	16.50	18.50	
	Pueblo	10.00	11.50	13.50	17.50	19.50	
	Denver	11.00	12.50	14.50	18.50	20.50	
	Kansas City	12.00	13.50	15.50	19.50	21.50	
Barstow, " "	El Paso	9.00	10.50	12.50	16.50	18.50	
	Pueblo	10.00	11.50	13.50	17.50	19.50	
	Denver	11.00	12.50	14.50	18.50	20.50	
	Kansas City	12.00	13.50	15.50	19.50	21.50	
Kramer, " "	El Paso	9.50	11.00	13.00	17.00	19.00	
	Pueblo	10.50	12.00	14.00	18.00	20.00	
	Denver	11.50	13.00	15.00	19.00	21.00	
	Kansas City	12.50	14.00	16.00	20.00	22.00	
Mojave, " "	El Paso	10.00	11.50	13.50	17.50	19.50	
	Pueblo	11.00	12.50	14.50	18.50	20.50	
	Denver	12.00	13.50	15.50	19.50	21.50	
	Kansas City	13.00	14.50	16.50	20.50	22.50	



# THE PUEBLO Smelting and Refining Company,

PUEBLO, COLORADO.

BUYERS OF

Gold, Silver, Lead and Copper Ores,  
Copper Matte and Bullion.

## Refiners of Gold, Silver, Lead and Copper.

Manufacturers of Bar and Pig Lead, Lead Pipe, Antimonial Lead, Copper Ingots,  
Granulated Test Leads and Litharge.

Pays Highest Prices for all classes of Ores.

Especial Attention to Sampling by most Approved Processes.

Quick Returns on all Consignments.

## CHAS. B. BOOTHE & CO.

— Dealers in —

*Engines, Boilers, Pumps, Shafting Hangers, Pulleys, Belting, Lubricating Oils,*

**Engineering Mining Hoists** *Irrigating,*  
**Supplies** *Oil Well,*

**IRON and WOODWORKING Machinery**

— Of All Kinds —

Electrical Machinery and Apparatus.

We invite an inspection of our goods at the New Store,

126-128 S. Los Angeles Street,

Los Angeles, Cal.

## VULCAN ROPEWAY

\*  
For Conveying  
Ore,  
Cordwood,  
Etc.



With Automatic Ore Loader and  
Automatic Dumping Device

EMPIRE, NEVADA, April 17th, 1898

Vulcan Iron Works:—GENTLEMEN: The ropeway furnished by your Company to convey tailings from Morgan Mill to Mexican Mill, a distance of seven-eighths of a mile, is giving entire satisfaction. We transport 200 tons of tailings in ten hours; one man does the whole business, including elevating tailings from hopper in the ground, operating Vulcan self-loader, and attending to the ropeway generally. The self-dumper requires no attention whatever. The Vulcan loader I consider the best feature in the whole Ropeway, making it possible for one man to load 200 tons in ten hours.

Yours very truly,

J. P. WOODBURY, Supt.

**VULCAN IRON WORKS,** Manufacturers of Mining Machinery,  
SAN FRANCISCO CAL.

### Babbit Metal

Holipac, guaranteed best Babbit Made  
COPPER FOR AMALGAMATING PLATES.  
Brassiers Sheet Copper.

BATTERY ZINCS, ROOFING TERNE PLATE

*Pacific Metal Works,*  
137-139 FIRST ST., SAN FRANCISCO, CAL.

**CLARENCE HERSEY,**  
**Assayer and Chemist,**

(Established 1879)  
LEADVILLE, - - COLORADO

Samples by Mail or Express Re-  
ceive Prompt Attention

SPECIMEN ASSAY PRICES:

Gold silver and lead, \$1.00; any two of the  
above, 75c; any one of above, 50c; copper assay,  
5c; platinum, nickel or tin, \$5.00.  
Write for full price list and mailing envelopes



## Fraser & Chalmers

### CHICAGO, ILL.

Have Brought Out a New Line of  
MEDIUM SIZED

#### STEAM HOISTING ENGINES



These are designed with great care by engineers familiar with the best previous practice, and knowing just what is wanted to render satisfactory service on a mine. Do you want such service? Then buy one of these improved machines.



#### OUR SPECIAL LINES OF MANUFACTURE

On which we would be glad to quote are:  
STAMP MILLS, SMELTING FURNACES,  
CYANIDE PLANTS, ORE CRUSHERS,  
FRUE VANNER CONCENTRATORS,  
RIEDLER AIR COMPRESSORS AND PUMPS,  
OTTO AERIAL TRAMWAYS,  
SHOES, DIES, CAMS,  
ROLLS AND JIGS.

Qualified by a Quarter Century of Experience to render you the best of service we invite your inquiries and patronage.

**Fraser & Chalmers,**  
CITY OF MEXICO: DENVER, COLO. CHICAGO, ILL.  
SALT LAKE CITY, UTAH 36 BROADWAY, N.Y.

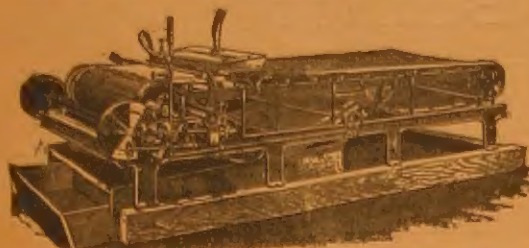
## JOSHUA HENDY MACHINE WORKS

Nos. 38 to 44 Fremont St., San Francisco

DEALERS IN AND MANUFACTURERS OF

All the Latest Improved

Mining, Sawmilling, Pumping, Smelting and  
Electrical Machinery, Engines and Boilers,  
and Mining Supplies of all kinds.



Hendy Improved Triumph Concentrator

Manufacturers of the HENDY IMPROVED TWO-STAMP MILL.

## BAKER IRON WORKS

LOS ANGELES, CALIFORNIA

Manufacturers of

Mining and Milling Machinery, Atlas Engines and Boilers, Worthington Steam Pumps



Water Works Machinery  
A SPECIALTY

## RISDON IRON WORKS

Office and Works, Cor. Beale and Howard Sts., San Francisco

Cable Address, "Risdon's," San Francisco

— MANUFACTURERS OF —

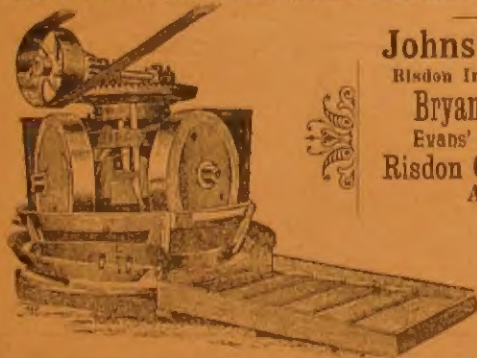
### Johnston Concentrators

Risdon Improved Concentrators, Frue Type  
Bryan Patent Roller Quartz Mills  
Evans' Patent Hydraulic Gravel Elevators  
Risdon Ore Feeders, 'Challenge' Type  
Air Compressors

Mining, Milling, Pumping  
and Hoisting Plants,

Risdon Pat. Water Wheels,  
"PELTON TYPE"  
KNIGHT WATER WHEELS  
GOLD AND SILVER STAMP MILLS

Catalogues and Prices on Application  
Risdon Hammered Steel Shoes and Dies



### IMPROVED HYDRAULIC GIANT

The above cut illustrates the improved form of Hydraulic Giant, in which the Center Bolt is dispensed with, which was so liable to catch trash.  
Prices and catalogues of our specialties sent free on application.

## PARKE & LACY COMPANY

21 and 23 Fremont St., San Francisco, Cal.



## MINING MACHINERY

SOLE AGENTS FOR  
THE INGERSOLL-SERGEANT AIR COMPRESSORS AND ROCK DRILLS.

SOLE LICENSEE FOR THE MANUFACTURE AND SALE OF

THE ROPP STRAIGHT LINE FURNACE.

For Roasting, Chlorinating and Desulfurizing Ores.

WE CARRY IN STOCK

Horizontal, Vertical and Portable Engines and Boilers. Rock Breakers, Cornish Rolls, Pulverizers, Concentrators, Ore Feeders. Hoisting Engines, Horse Power Hoisting Wheels, Water Wheels, Steam Pumps, Ore Cars, Wire Rope, Ore Buckets, Water Buckets, Skips. Blowers and Exhaust Fans, Shafting and Pulleys. Belting, Oils and Mine Supplies. Manganese Steel Shoes and Dies

Estimates furnished for complete plants for Roasting Works, Smelters, Concentrating and Stamp Mills.

